VASCULITIS FOUNDATION

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Patient Handbook
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VASCULITIS FACTS

1. **Vasculitis represents a family of 15 rare diseases** including: Behcet's disease, Buerger's disease, Central Nervous System, Churg Strauss syndrome, Cryoglobulinemia, Giant Cell Arteritis, Henoch-Schönlein purpura, Hypersensitivity vasculitis, Kawasaki disease, Microscopic Polyangiitis, Polyarteritis nodosa, Polymyalgia rheumatica, Rheumatoid vasculitis, Takayasu's arteritis, and Wegener's Granulomatosis.

2. Vasculitis is **an autoimmune disease**. The cause of autoimmune disease is unknown. An autoimmune disease occurs when the body mistakes its own cells for foreign invaders and produces antibodies to attack the perceived invaders as a defense against infection.

3. Vasculitis is an **inflammation of the blood vessels, arteries, veins, or capillaries**. The inflammation of the blood vessel causes a weakening and narrowing of the blood vessel wall that deprives affected tissues and organs of blood supply resulting in tissue and organ damage.

4. Vasculitis **can affect any blood vessel or organ** in the body. Signs and symptoms of vasculitis vary widely in type and severity. Some are specific to a particular organ and others are non specific causing general aches, pains and fatigue. Organ systems affected include the skin, joints, lungs, kidneys, gastrointestinal tract, blood, eyes, brain, nerves, sinuses, nose and ears.

5. **The cause of vasculitis is unknown**. It affects people of all ages, gender, race and nationalities. Some types of vasculitis are more likely to occur in certain populations than others.

6. **Early diagnosis of vasculitis is critical** to avoid permanent organ damage. Diagnosis of vasculitis is made by clinical and laboratory findings. Laboratory tests include blood tests, urinalysis, chest and sinus x-rays and other tests as needed. A tissue biopsy is usually the definitive test.

7. Vasculitis is **treated with prescription medications** with the goal of stopping the inflammation and relieving the symptoms. Corticosteroid medication and cytotoxic medicines are the drugs that are commonly prescribed. There is no known cure for vasculitis and its course varies from person to person. Some people go into remission. For others, the disease remains chronic with recurring relapses. In rare cases, vasculitis causes severe disability or death.

8. Vasculitis is a **rare disease**. For example, the incidence of Wegener's Granulomatosis and Polyarteritis nodosa is 3/100,000 persons. The incidence of Giant Cell Arteritis and Henoch-Schönlein purpura is 20/100,000 persons. Takayasu's arteritis occurs in 1/100,000 persons. Each year, 100,000 Americans are hospitalized for vasculitis care.

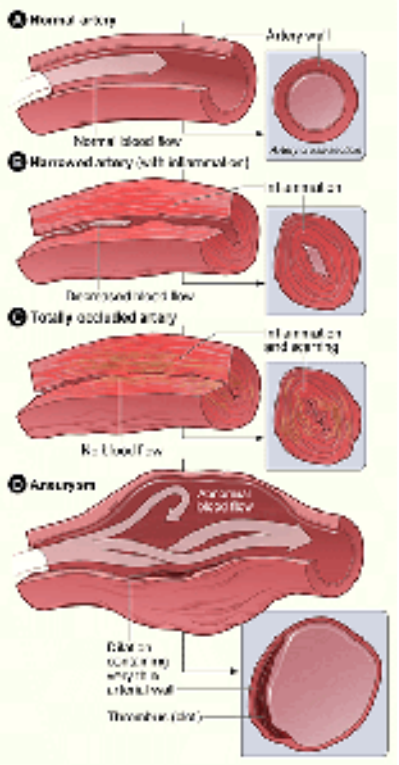
WHAT IS VASCULITIS?

Vasculitis is an inflammation of the blood vessels in the body. In vasculitis, the body's immune system mistakenly attacks the body's own blood vessels, causing them to become inflamed. Inflammation can damage the blood vessels and lead to a number of serious complications. Vasculitis can affect any of the body's blood vessels. These include arteries, veins, and capillaries. Arteries are vessels that carry blood from the heart to the body's organs, veins are the vessels that carry blood back to the heart, and capillaries are the tiny blood vessels that connect the small arteries and veins.

When a blood vessel becomes inflamed, it can:
Narrow, making it more difficult for blood to get through
Close off completely so that blood can't get through at all (occlusion)
In rare cases, stretch and weaken so much that it bulges (aneurysm) and may possibly burst (aneurysm rupture)

Figure A shows a normal artery with normal blood flow (the inset image shows a cross-section of the normal artery). Figure B shows an artery narrowed due to inflammation in the arterial wall, causing decreased blood flow (the inset image shows a cross-section of the inflamed artery). Figure C shows a totally occluded (blocked) artery due to inflammation and scarring in the arterial wall (the inset image shows a cross-section of the block artery). Figure D shows an artery containing an aneurysm.

The disruption in blood flow from inflammation can damage the body's organs. Specific signs and symptoms depend on which organ has been damaged and the extent of the damage. Typical signs and symptoms of inflammation (fever, swelling, and a general sense of feeling ill) are common among people with vasculitis.



Outlook: The outlook for people who have vasculitis varies depending on both the type and severity of the vasculitis. The course of a case of vasculitis can be hard to predict. Treatment is often very effective if vasculitis is diagnosed and treated early. Vasculitis may disappear or go into a period of remission. In some cases, it may be a chronic problem, requiring ongoing treatment, or it may come back ("flare") after a period of remission. In more severe cases, treatment may not help, and vasculitis can lead to disability or even death.

Much is still unknown about vasculitis. There are many different types of vasculitis, but overall it is a fairly rare condition in the general population. Additional research is needed to learn more about the various types of vasculitis and their causes, treatments, and remission patterns.

Other Names for Vasculitis
Angiitis
Arteritis

What Causes Vasculitis?
Vasculitis is an inflammation of the blood vessels, but what causes the inflammation is often unknown. It is sometimes a side effect of the body's immune system response to a recent or chronic infection. It also can be a side effect of the body's response to a medicine. The body sometimes recognizes a medicine as a foreign substance, and may develop an "allergic reaction" to try to get rid of it.

Vasculitis is sometimes linked to other diseases, such as: Autoimmune system diseases. These are diseases that the vasculitis patient may have had for years, in which the body's immune system mistakenly attacks the body itself. Examples include systemic lupus erythematosus (lupus), rheumatoid arthritis, and scleroderma.

Who Is At Risk for Vasculitis?
Vasculitis can affect anyone, including men, women, and people of all ages. Some types of vasculitis are more likely to affect certain populations than others. Examples of populations that might be more affected by certain types of vasculitis include smokers, children, young women, middle-aged adults, and people with chronic hepatitis B and/or C infections.

What Are the Signs and Symptoms of Vasculitis?
Vasculitis can have many different signs and symptoms depending on the type of vasculitis and which organs are involved as well as how severely they are affected. With vasculitis, any number of organs may be involved, so a patient can experience very few signs and symptoms or may be very sick.

There are two types of signs and symptoms that are common among people with vasculitis: those that affect the body in a general way (systemic) and those that affect specific organs or body systems.

Systemic
Systemic signs and symptoms are not specific to a particular part of the body, but affect a person overall, causing general aches, pains, and sickness. Common systemic symptoms include:

- Fever
- Loss of appetite
- Weight loss
- Fatigue (feeling tired) and weakness
- General aches and pains

Organ or Body System-Specific
These signs and symptoms are specific to a particular organ or body system. The organs and body systems that can be affected include:

Skin. People may experience a variety of skin changes, including purple or red spots. The changes may look like clusters of small dots, splotches, bruises, or hives. They may be itchy or painless.

Joints. People can experience aches and arthritis if the joints are affected.

Lungs. People may experience shortness of breath or even cough up blood. On a chest x ray, lung symptoms may look like pneumonia, even though they are not.

Gastrointestinal tract. Ulcers in the mouth may be present in some types of vasculitis. Also, abdominal pain or bloody diarrhea can occur in people with vasculitis. In some severe cases, the intestines can rupture.

Sinuses, nose, and ears. People may experience sinus infections, chronic middle ear infections, ulcers in the nose, or in certain cases there may be hearing loss.

Eyes. People whose eyes are affected by vasculitis may experience a blurring or loss of vision.

Brain. People may experience headaches, confusion, changes in behavior, or strokes.

Nerves. People may experience numbness, tingling, and weakness in various parts of the body. They also may experience symptoms in their limbs, such as loss of feeling or strength in the hands and feet or shooting pains in the arms and legs.

How Is Vasculitis Diagnosed?
The diagnosis of vasculitis is based on a person's medical history, physical exam, signs and symptoms, and laboratory tests.

Specialists Involved
A person with vasculitis may be referred to various specialists, including:

- A dermatologist (skin specialist)
- A hematologist (blood specialist)
- A pulmonologist (lung specialist)
- A cardiologist (heart specialist)
- A neurologist (nervous system specialist)
- An ophthalmologist (eye specialist)
- A urologist (urinary tract and urogenital system specialist)
- A nephrologist (kidney specialist)
- An infectious disease specialist

Diagnostic Tests and Procedures
A variety of tests are used to diagnose vasculitis. The type of test chosen will depend on the signs and symptoms a person has. Some of the tests used in the diagnosis of vasculitis include:

Blood tests. These may be done to look for abnormal levels of blood cells or antibodies, which could be a sign of inflammation in the body.

Biopsy. During this test, the doctor takes a small sample of tissue from a blood vessel or one of the affected organs and looks at it under a microscope for inflammation or damage. A biopsy is often the best way to make a firm diagnosis of vasculitis.

Urine analysis. This test might be done to look for abnormal levels of protein or blood cells in the urine, which could be a sign of vasculitis affecting the kidneys.

EKG (electrocardiogram). This test measures the rate and regularity of the heartbeat, and is done to see if vasculitis is affecting the heart.

Echocardiogram. This test uses sound waves to create a moving picture of your heart. Echocardiogram provides information about the size and shape of your heart and how well your heart chambers and valves are functioning. The test also can identify areas of poor blood flow to the heart, areas of heart muscle that are not contracting normally, and previous injury to the heart muscle caused by poor blood flow.

Chest x ray. A chest x ray takes a picture of the organs and structures inside the chest, including the heart, lungs, and blood vessels. A chest x ray may show abnormal changes if vasculitis is affecting the lungs.

Pulmonary function testing. These are breathing tests that evaluate how well the lungs are working. These tests are done to see if vasculitis is affecting how the lungs work.

Abdominal ultrasound. This test uses sound waves to create a picture to look for vasculitis affecting the abdominal organs. It is similar to an echocardiogram.

Computerized tomography (CT) scan. A CT scan provides a computer generated x-ray image of the internal organs. CT scans can be used to look for vasculitis affecting the abdominal organs or the brain.

Magnetic resonance imaging (MRI). This test uses powerful magnets and radio waves to make images and can be used to look for a vasculitis affecting the brain.

Angiography. This test may be done to see the flow of blood through the blood vessels and to determine whether they are blocked. During this test, a dye is injected into the blood vessels, and x-ray pictures of the blood vessels are taken.

How Is Vasculitis Treated?
Most cases of vasculitis are treated with prescription medicines.

Goals of Treatment
The main goal of treatment is to stop the inflammation in the affected blood vessels. Most treatments do this by stopping the immune or inflammatory response that caused the vasculitis to occur.

Specific Types of Treatment
There are two types of prescription medicines that are typically used to treat vasculitis: corticosteroid medicines and cytotoxic medicines.

Corticosteroid Medicines
Corticosteroid medicines are often called steroids, though these are not the same kind of steroids that athletes have been reported to use. These medicines are used to reduce the inflammation in the blood vessels. Examples of corticosteroids that the doctor might prescribe include prednisone, prednisolone, and methylprednisolone.

Cytotoxic Medicines
Cytotoxic medicines are typically used to treat cancer, but certain drugs also can be used to treat vasculitis. They may be prescribed in severe cases or in cases in which the patient did not respond to corticosteroids. Sometimes, they are prescribed along with corticosteroids. Cytotoxic medicines work by killing the cells that have caused the inflammation. Examples of these medicines include azathioprine and cyclophosphamide. Doses used for vasculitis are usually lower than those used to treat cancer.

How Can Vasculitis Be Prevented?

There is currently no known way to prevent vasculitis, but with treatment, the complications of vasculitis can be prevented or delayed.

Living With Vasculitis

General Information About Outcomes

The course of vasculitis is unpredictable and depends on the type and severity of the disease.

Vasculitis may:

- Go into remission. If caught early it may respond well to treatment and go into remission.
- Reoccur. These reoccurrences are called flares, and they are generally difficult to predict. Flares can sometimes happen when the doctor takes the patient off of a medicine or alters the dose or type. Also, certain types of vasculitis are more likely to flare than others, and some patients are more likely to experience flares than others.
- Remain chronic without remission. In these cases, vasculitis can usually be controlled with continuing medicine treatments for an extended period of time.
- Not respond well to treatment. This can lead to disability or even death. This is rare.

Ongoing Health Care Needs

The medicines used to treat vasculitis can have significant side effects. Your doctor may adjust the type or dose of medicine you take to lessen the side effects. In cases in which remission occurs, the doctor may carefully withdraw medicines but still require careful monitoring of flares. Patients who continue taking medicines should stay under the careful watch of their doctor to monitor and control side effects. Patients also should always monitor their health, side effects, and symptoms and discuss any changes with their doctor.

Key Points

Vasculitis is an inflammation of blood vessels in the body. In vasculitis, the body's immune system mistakenly attacks the body's own blood vessels, causing them to become inflamed.

The inflammation can cause disruption of blood flow to parts of the body, which can lead to tissue damage or even death.

Vasculitis can affect any blood vessel or organ in the body.

The exact cause of the inflammation in vasculitis is unknown, but it is sometimes a side effect of the body's normal immune system response.

Vasculitis can affect people of all ages and either gender. Some types of vasculitis are more likely to occur in certain populations than others.
There are many types of vasculitis, and the signs and symptoms vary widely in type and severity. They may be specific and affect a particular organ, or they may be nonspecific, causing general aches, pains, and fatigue (feeling tired).

Laboratory tests are usually performed to confirm a diagnosis of vasculitis. There are many different tests that may be run, depending on the signs and symptoms present and where they are in the body.

Vasculitis is typically treated with prescription medicines with the goal of stopping the inflammation in the blood vessels and relieving symptoms.

Corticosteroid medicines or cytotoxic medicines are typically the drugs used to treat vasculitis. The course of a case of vasculitis is often difficult to predict. Vasculitis may go into remission, reoccur, remain chronic, or, in rare cases, lead to severe disability or death.

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http://www.nhlbi.nih.gov/health/dci/Diseases/vas/vas_all.html
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Behcet's disease is a type of vasculitis characterized by mouth sores, genital sores, inflammation inside of the eye, skin problems, and arthritis (swelling of the joints).The disease usually affects more men than women. The disease appears to be more severe in young, male, and Middle Eastern or Far Eastern patients.

The most **striking feature** is the presence of painful ulcers (sores). Oral (mouth) ulceration that happens more than three times in one year is considered to be diagnostic for Behçet's disease. Genital ulceration and skin lesions occur in 75% or more of patients. Brain (neurologic) disease occurs in less than one-fifth of patients. Inflammation inside the eye occurs in 25-75 % of patients. Both the small and large blood vessels (the vascular system) can be affected. People who have vascular involvement are at an increased risk of venous thrombosis (a blood clot in a vein). The vessels of the central nervous system (brain and spinal cord) or the heart may also be affected by Behcet's disease.

The underlying **cause** of Behçet's disease is unknown. There may be environmental or viral factors that make a person's immune system act differently, due to a genetic predisposition. Investigators are researching these and other possible causes.

There are no specific **laboratory tests** in Behçet's disease and therefore the diagnosis is made on the basis of the clinical findings.

The available data on **treatment of** Behçet's disease were systematically reviewed and published in 2000. Ten trials involving 679 patients were included. Some of the classic treatments for Behçet's syndrome appeared to be less effective than previously thought. These included colchicine, cyclophosphamide, and glucocorticoids for eye involvement, azapropazone and colchicine for arthritis, and acyclovir, colchicine, and topical interferon for mouth ulcers. Protective effects were noted with cyclosporine and azathioprine for eye disease and Benzathine penicillin for arthritis.

Several other agents such as Interferon alfa, thalidomide**,** methotrexate, mycophenolate mofetil, anti-tumor necrosis factor-alpha (TNF) therapy**,** and infliximab have been used in small studies.

Side effects of treatments for Behçet's disease include suppression of the bone marrow and the immune system leading to a greater chance of getting infections.

Corticosteroids are associated with increased risk of diabetes and bone mineral loss depending on the total period of treatment as well as the specific characteristics of the patient (gender, age). The use of Cyclosporine may cause hypertension (high blood pressure) and glucose intolerance. Cyclosporine is also considered to be damaging to the kidney, so close monitoring of the kidneys is needed.

Prognosis: Most people with Behçet's disease can lead productive lives and control symptoms with proper medication, rest, and exercise. When treatment is effective, flares usually become less frequent. Many patients eventually enter a period of remission (a disappearance of symptoms). Sometimes, treatment does not relieve symptoms, and gradually more serious symptoms such as eye disease may occur. Serious symptoms may appear months or years after the first signs of Behcet's disease occur.

Buerger's Disease is vasculitis causing insufficient blood flow to the hands and feet, producing numbness, tingling and ultimately skin and gangrene. The classic Buerger's patient is a male, between the ages of 20 and 40, although there is a higher percentage of women and people over the age of 50 being diagnosed. Buerger's disease is most common in the Orient, Southeast Asia, India and the Middle East, but appears to be rare among African–Americans.

Diagnosis: Angiograms of the extremities is helpful in making the diagnosis. Skin biopsies are not recommended due to the concern that the biopsy site will not heal.

Treatment: Buerger's disease is associated with smoking and tobacco produces. Patients **must stop smoking** immediately. Abstinence from these products is the only way to treat this disease. Although anti-inflammatory agents (steroids) have proven beneficial in other vasculitides, they are not beneficial in treating Buerger's.

Isolated central nervous system vasculitis also known as primary angiitis of the central nervous system (CNS), is a condition where the body's immune system attacks arteries of the brain, causing inflammation (swelling).

The **cause** of CNS is unknown. Researchers believe that some sort of event, like an infection, may trigger an inappropriate immune response directed mistakenly to the small and medium sized arteries of the brain.

Among the reported cases of CNS, there are more males who are diagnosed with the disease, and although most get the disease in their 40s or 50s, children as young as 3 and adults as old as 78 have been diagnosed with CNS.

The most common **symptoms** of CNS are: confusion, headache, personality changes, and muscle weakness/paralysis similar to what happens when someone suffers a stroke. Other symptoms include seizures, bleeding in the head, coma, and vision loss. Symptoms usually occur over the course of several months, but can also occur very quickly.

Nonspecific **laboratory abnormalities** have been noted among patients with CNS. The diagnosis of CNS can be done in different ways. The principal form of diagnosis remains angiography (x-rays of arteries), but magnetic resonance imaging (MRI) and CT scanning have also been utilized. None of these alone can be diagnostic of CNS. A common concern is that angiography in a patient with possible cerebral vessel inflammation is unsafe, and may result in complications. However a study of 125 cerebral angiograms, found no greater risk of complications in patients with proven CNS vasculitis than in those with normal angiograms. A lumbar puncture may also be performed to look for abnormalities in the cerebrospinal fluid.

The symptoms, signs, or findings among patients with CNS may "mimic" a number of disorders including other primary CNS vasculitides, systemic vasculitis, CNS infections or drug-induced disorders by methamphetamine, cocaine, "crack", and ephedrine abuse.

Early reports of patients with cerebral vasculitis suggested a less optimistic prognosis but more recent experience with immunosuppressive therapy has resulted in encouraging outcomes.

If the **diagnosis** of CNS is confirmed by biopsy, treatment with high doses of glucocorticoids (steroids) is warranted. Cytotoxic agents such as cyclophosphamide (Cytoxan) can be added depending on the clinical severity of the vasculitis.

Side-effects of high-dose glucocorticoids should be anticipated such as glucose intolerance or frank diabetes mellitus (condition of abnormal glucose levels in blood). Use of calcium supplements, vitamin D, hormone replacement therapy, and bisphosphonates can be taken to help protect the body from bone mineral loss. Antibiotics can also be taken to help prevent infection due to the use of immunosuppressants.

Churg-Strauss syndrome (CSS), also called allergic granulomatosis and angiitis, is a disorder characterized by allergic rhinitis (inflammation of the nose), asthma, and an alteration in blood counts called eosinophilia. The organs involved are usually the lung and the skin although any organ system can be affected including the cardiovascular (heart), gastrointestinal (stomach), kidneys and the central nervous system.

Both men and women are equally diagnosed with CSS. The mean age at diagnosis is 50 years, but the systemic vasculitic phase is frequently apparent in patients who are in their late 30s. It is uncommon in people older than 65 years.

The disease is most likely due to an autoimmune process, which is a disorder of the immune system.

The **clinical manifestations** of CSS usually has three stages.

1. The **first phase** is called the “allergic” phase and is characterized by characterized by allergic inflammation of the nose, the skin and the lungs. People are often diagnosed with late onset asthma during this phase.

2. The **second phase** is called the “hypereosinophilic” phase, which means that there are too many eosiniphils (a type of white blood cell) in the body. This phase is characterized by inflammation of the esophagus, stomach or intestines.

3. The **third phase** is the “systemic vasculitis” phase. During this phase there is inflammation and damage of blood vessels. Blood vessels can be damaged in different parts of the body. During this phase people may suffer from fever, weight loss, and lack of energy.

Asthma is the main feature of CSS (occurring in more than 95 % of patients) and usually precedes the vasculitic phase by approximately 8 to 10 years. It is frequently chronic and of sufficient severity to require long-term corticosteroid therapy.

Allergic rhinitis and skin involvement are also common. Manifestations of cardiac involvement in CSS include pericarditis, a condition characterized by inflammation of the external part of the heart, heart failure and myocardial infarction (heart attack). Dysfunction of the peripheral nerves, usually called mononeuritis multiplex, is seen in up to 75 %of patients with CSS.
Kidney involvement may be more common than is generally reported. A gastroenteritis (inflammation of the gastrointestinal duct) characterized by abdominal pain, diarrhea, bleeding, may precede or coincide with the vasculitic phase of CSS.
There are no specific **laboratory** tests for CSS. Eosinophilia, the increased percent of eosinophils, a type of white blood cells, above the normal range in blood counts is the most characteristic finding.

Antineutrophil cytoplasmic antibodies (ANCA) are found in several systemic vasculitides including CSS, and 38 to 59 % of CSS patients are ANCA positive.

The **diagnosis** of CSS is suggested by the clinical findings and then confirmed by lung biopsy or biopsy of affected tissues.

Treatment: Most patients with CSS respond favorably to corticosteroid therapy. Late relapses after a successful response to treatment are uncommon so treatment can be discontinued in most patients. Additional treatment options include inhaled steroids, cyclophosphamide (Cytoxan), azathioprine (Imuran) , and high-dose intravenous immune globulin (IVIG) have been used in patients with severe disease or disease that is unresponsive to corticosteroids. Such patients have been improved with a regimen of corticosteroids and interferon-alpha. Plasma exchange occasionally has been used in conjunction with other therapies.

All the immunosuppressive drugs include the possibility of development of infections since the immune system is weakened. In addition adverse effects of corticosteroids may include glucose intolerance or frank diabetes mellitus (condition of abnormal glucose levels in blood). Patients should be aware and watchful in order to report symptoms suggestive of diabetes or infection. Use of glucocorticoids may also predispose to, or worsen preexisting, osteoporosis, a disorder of the bone density. This is a particular concern especially for postmenopausal women and older men. Use of calcium supplements, vitamin D, hormone replacement therapy and/or bisphosphonates can help protect against bone mineral loss.

Autoimmunity is an unpredictable disorder developing under unspecified yet conditions. Psychological, environmental, genetic factors interfere and in combination with the treatment option selected lead to an individualized course and prognosis for each patient.

Cryoglobulinemia is the presence of abnormal proteins that are occasionally found in the blood of people with some forms of autoimmune diseases, multiple myeloma, leukemia, and certain forms of pneumonia. The proteins cause the blood to gel at low temperatures causing tissue necrosis.

Causes: Type 1 cryoglobulinemia is often associated with lymphoma. Type 2 cryoglobulinemia is often associated with hepatitis C infection. Drug usage is a prime risk factor for patients with cryoglobulinemia. Hepatitis C is acquired by injection drug use (needle–sharing), tainted blood products, and (probably rarely), sexual transmission.

Symptoms may include a rash on the lower limbs, arthritis, nerve damage and tissue necrosis of affected areas.

Treatment depends on the type of cryoglobulin, underlying disease, and severity of symptoms. Cryoglobulinemia with severe hyperviscosity syndrome requires plasmapheresis and chemotherapy of the underlying malignancy. Some patients with cryoglobulinemia suffer from mild, recurrent crops of lower extremity purpura that require no specific therapy. The most effective treatment for cryoglobulinemia associated with hepatitis C has not yet been determined. Treating the hepatitis may be an effective therapy for this type of vasculitis. Brief use of prednisone followed by 6 months of interferon alfa has produced clinical and liver function test improvement, but relapse of liver disease and vasculitis often occurs when interferon alfa is stopped.

Giant cell (temporal) arteritis (GCA) is a vasculitis of large and medium size vessels. It may be generalized but vessel inflammation most frequently involves vessels in the scalp and head, especially the arteries over the temples. The disease is called temporal arteritis because the temporal arteries, which course along the sides of the head just in front of the ears (to the temples) often become inflamed. Women, Caucasians, and individuals over 50 years of age are most commonly affected by GCA.

The onset of the **symptoms** in GCA tends to be gradual and includes low grade fever, fatigue, weakness and weight loss. A new headache, mild or severe, occurs in at least two-thirds of patients with the pain tending to be located over the sides of the head in front of the ears but may be frontal or other located. Nearly one-half of patients suffer from pain in the jaw after chewing (called jaw claudication). Impaired vision is often an early manifestation of the disease. Permanent partial or complete loss of vision in one or both eyes has been observed in 15-20 % of patients. It is rare for patients to become completely blind in both eyes.

Polymyalgia rheumatica (PMR), which is characterized by pain in the shoulders and hips, is closely linked to GCA, occurring in about 40-50 % of patients.

A **laboratory** abnormality seen in most patients with GCA is a very high erythrocyte sedimentation rate (ESR). The ESR measures how fast a patient's red blood cells settle when placed in a small tube. Anemia or low red blood cell count and microscopic hematuria (blood in the urine) may be found but renal (kidney) impairment is unlikely to be due to GCA. Other tests are occasionally abnormal with non specific meaning.

Temporal artery biopsy is suggested in all cases of suspected GCA. Even though the diagnosis may appear "classic" a temporal artery biopsy is still recommended. The biopsy is of low risk, causes very little pain, and often leaves little or no scar. After the use of a topical numbing medication (the same one used by a dentist), the doctor can remove a small part of the temporal artery from under the scalp in order to examine it under the microscope.

Other ways to diagnose GCA include: ultrasonography, angiographic examination, computerized topographic scanning and magnetic resonance angiography, high resolution magnetic resonance imaging and position emission tomography (PET).

Glucocorticoid **treatment** should be instituted once the diagnosis of GCA is established.

Glucocorticoids have inhibitory effects on a broad range of specific immune responses. Their effectiveness in GCA is well established by years of use. Daily dosing is more effective than alternate day dosing. This response usually occurs within two to four weeks after the institution of therapy. The diagnosis should be reevaluated in patients who are resistant to adequate steroid therapy. Steroid withdrawal can begin once clinical remission has been induced. Relapses are seen more frequently in the first year or two of the disease.

Adverse effects of corticosteroids are glucose intolerance or frank diabetes mellitus (condition of abnormal glucose levels in blood) and infections. Patients should be aware and watchful so as to report symptoms suggestive of diabetes or infection. Use of glucocorticoids may also predispose to, or worsen preexisting, osteoporosis (abnormal bone density condition) especially in postmenopausal women and older men. Use of calcium supplements, vitamin D, hormone replacement therapy and/or bisphosphonates are can be helpful in preventing bone mineral loss.

Relapses often necessitate increased dosage or prolonged steroid treatment. Some researchers have suggested that the addition of methotrexate may be steroid-sparing while others have not

demonstrated any benefit. However the routine addition of methotrexate to glucocorticoid therapy for GCA is not recommended. The efficacy of other cytotoxic drugs, dapsone, antimalarials, etanercept, and penicillamine has not been studied adequately although they have been reported to be helpful in some case reports.

The **finding** of an increased risk of visual loss in patients with GCA and thrombocytosis (increase of the number of platelets in the blood), has led some to suggest the addition of drugs like aspirin for patients with high platelet counts, but there is not a lot of data to prove that this may reduce brain/skull problems.

Henoch-Schönlein purpura (HSP) is a systemic vasculitis that causes the blood vessels in the skin to become inflamed, causing red spots. When the blood vessels in the skin get inflamed, they can bleed, causing a rash that is called purpura. This rash is typically seen on the lower legs or arms. The specific skin lesion is characterized by the tissue deposition of an immune system product, called IgA immunoglobulin, which is also found in kidneys of patients with a renal disease, called IgA nephropathy.

HSP occurs more often in children than in adults, and many cases follow an upper respiratory tract infection (infection in your sinuses and /or lungs). Half of affected children are under age five, although kidney involvement is more likely to be severe in older children. Compared to children, adults had more severe and frequent kidney involvement.

Symptoms occur over a period of days to several weeks: skin rash, joint aches and pains, usually in knees and ankles, occasional swelling, abdominal pain and renal disease manifesting mostly as hematuria (blood in your urine), proteinuria (abnormal excretion of proteins in urine), edema (selling) or alteration in the volume of urine. The hematuria may be noticed as red or tea-colored or cola-colored urine or the amount may be so small that it can only be seen under a microscope. The brain or the lung may also be involved in HSP.

Gastrointestinal symptoms are present in the majority of patients including abdominal pain that is frequently associated with vomiting. The pain typically develops within eight days of the appearance of the rash. Bleeding of the gastrointestinal duct presenting with black or bright red color in stools is seen in these patients. Although rare, more serious complications may develop like intussusception, a situation in which one portion of the bowel slides into the next creating an obstruction in the bowel, leading to swelling, inflammation, and decreased blood flow to the intestines involved or inflammation of other organs leading to pancreatitis, cholecystitis, and entero nephrotic pathy.

Renal (kidney) involvement is common, occurring in 30-70 % of patients. Kidney disease is usually noted after the onset of systemic symptoms. More marked findings may also occur including nephrotic syndrome, a situation characterized by abnormal excretion of proteins and lipids in urine, swelling (edema), low level of albumin in blood and hyperlipidemia. High blood pressure (hypertension) and acute kidney failure may also be seen. Worsening of the kidney symptoms and biopsy-confirmed worsening of the kidney lesions may be observed in patients with repeated attacks of rash or hematuria (blood in the urine).
Even though the symptoms of HSP make it easier to diagnose in children, confirmation of the diagnosis of HSP requires evidence of tissue deposition in the skin or kidney of IgA immunoglobulin. Renal biopsy is another method to establish the diagnosis, but is reserved for patients in whom the diagnosis is uncertain or in whom there is evidence of more severe renal involvement.

The overall **outcome** is good in most patients. All of the manifestations of active HSP usually resolve spontaneously, although recurrent episodes of skin rash and hematuria may be seen. Among those with kidney involvement, only a minority have persistent disease. The kidney prognosis is excellent in most patients. However some patients will have persistent protein in their urine, high blood pressure, and renal insufficiency. It is estimated that HSP accounts for approximately 3% of cases of end-stage kidney disease in children. Poor renal prognosis is more common among those with the nephrotic syndrome, renal insufficiency, and more advanced findings on biopsy.

Recurrences are common, occurring in approximately one-third of patients. Since complete recovery occurs in 94% of children and 89 % of adults, respectively, most patients receive no specific therapy. There is suggestive evidence that corticosteroids enhance the rate of resolution of the arthritis and abdominal pain, although they do not appear to prevent recurrent disease.

However, specific **treatment** is recommended in patients with marked proteinuria (protein in the urine) and/or impaired kidney function during the acute episode. A kidney biopsy can be performed to reveal the severity of the lesions which appears to be the best indicator of prognosis. Advanced disease, usually defined as crescentic nephritis, is treated with a regimen consisting of pulse intravenous methylprednisolone followed by oral prednisone.

Other regimens that have been evaluated in children with kidney disease include corticosteroids and azathioprine and multidrug regimens such as corticosteroids, cyclophosphamide, and dipyridamole, or corticosteroids, cyclophosphamide, heparin/warfarin, and dipyridamole. However, since spontaneous recovery is often observed in these patients, it remains unknown whether these regimens are superior to no or less aggressive therapy.

Plasmapheresis has also been used in a number of patients with severe disease although its efficacy is uncertain. Intravenous immune globulin has been tried in a small number of patients with heavy proteinuria and a progressive decline in kidney function.

Kidney transplantation can be performed in those patients who progress to end-stage kidney disease, although recurrent disease can occur. This appears to be more likely in patients with aggressive initial disease who progressed to end-stage kidney disease in less than three years after the onset of HSP. Therefore it is recommended the transplantation to be delayed for 12-24 months after the disappearance of the rash. Some observations suggest that the risk of recurrent disease also may be higher in living-related donors.

Hypersensitivity vasculitis

Hypersensitivity vasculitis is often used to describe different types of vasculitis related to drug reactions, skin disorders or allergic vasculitis; however this is not always the correct use of the term.

Given the wide range of **symptoms**, the varying definitions and frequent incorrect use of the term, the American College of Rheumatology made a list of criteria for the classification of hypersensitivity vasculitis. Three or more of these criteria are needed to determine that a patient with some form of vasculitis is defined as specifically having hypersensitivity vasculitis. The criteria are:

(1) older than 16 years of age
(2) use of a drug before the development of symptoms
(3) skin rash
(4) biopsy of the skin rash that shows neutrophils, a type of white blood cells, around a small vessel

It should be noted that having three of these criteria does not always distinguish hypersensitivity vasculitis from other forms of vasculitis, particularly when the only or first symptom of vasculitis is a skin rash.

The presence of skin vasculitis, usually red spots, is the main symptom in hypersensitivity vasculitis. A biopsy of these skin spots reveals inflammation of the small blood vessels, called a leukocytoclastic vasculitis.

Hypersensitivity vasculitis may be caused by a specific drug or occur in association with an infection, but it may also be idiopathic, meaning there is no known cause. Although drugs are the most common cause, drug-induced vasculitis is a poorly defined disorder.

There are no symptoms or tests that prove hypersensitivity vasculitis results directly from a particular drug. The drugs that are most frequently listed as being associated with the development of hypersensitivity vasculitis include: penicillin, cephalosporin, sulfonamide, some medicines used to control blood pressure (loop and thiazide-type diuretics), phenytoin and allopurinol. Infections that may be associated with hypersensitivity vasculitis include hepatitis B or C virus, chronic infection with bacteria and HIV virus.

Symptoms: The major symptoms of hypersensitivity vasculitis, in addition to a skin rash, are joint pains and increasing size of lymph nodes. Lymph nodes are located in several places, but particularly along the neck, and supply special cells to the bloodstream that help remove bacteria from the body. In most patients, symptoms begin 7 to 10 days after the exposure to the drug or infection, but can be as short as two to seven days in some people.

Organ involvement in addition to the skin rash is very rare, but can be severe. Kidney inflammation and even more rarely liver, lung, heart and brain injury have occurred in patients with hypersensitivity vasculitis. The kidney inflammation is usually mild.

Symptoms of kidney involvement may not be noticed by the patient, but can be evaluated by a doctor by looking at a urine sample for small amounts of blood and protein. Kidney failure is not common, but can occur particularly with heavy or prolonged exposure to the suspected drug or infection. Kidney failure can be ‘acute’, meaning there is a fast loss of kidney function, but supportive treatment with dialysis (mechanical cleansing of the blood) can be done for a few days or weeks and kidney function returns. In some cases, ‘chronic’ kidney failure occurs, meaning that there is an ongoing need for dialysis because the kidneys do not recover their normal function.

Treatment: If a drug may have caused the hypersensitivity vasculitis, then discontinuation of that specific drug usually leads to the disappearance of symptoms within a few days or weeks. If an infection may have caused the hypersensitivity, then treatment of the infection usually results in the disappearance of symptoms.

In some patients, especially those with ongoing infections such as hepatitis B or C, there may be ongoing or ‘chronic’ symptoms of hypersensitivity vasculitis. Drugs used to manage the skin rash and joint pains associated with hypersensitivity vasculitis might include corticosteroids and/or nonsteroidal anti-inflammatory drugs.

In patients with more severe or ongoing skin rashes that are not due to infection, drugs such as colchicine, antihistamines, and dapsone (or a combination of these drugs) may be helpful to control symptoms. Patients with disease in organs beyond the skin should be referred to a specialty doctor such as a nephrologist if the kidneys are involved.

Kawasaki Disease is a rare vasculitis, which strikes children. Over 4,000 children develop it each year. 80% of patients are under the age of 5. Patients usually begin with a fever that lasts at least five days.

Symptoms may include red eyes, lips, and mouth; rash; swollen and red hands and feet; and swollen lymph nodes. The disorder affects the mucus membranes, lymph nodes, walls of the blood vessels, and the heart. The most important aspect of the disease is the heart's involvement. The disease can cause inflammation of blood vessels in the coronary arteries, which can lead to aneurysms. Kawasaki is the leading cause of acquired heart disease in children.

Cause: There is no known cause of the disease.

Symptoms: Kawasaki disease often begins with a high and persistent fever greater than 102°F, often as high as 104°F. A persistent fever lasting at least five days is considered a hallmark sign. The fever may persist steadily for up to two weeks and is not very responsive to normal doses of acetaminophen or ibuprofen.

Diagnosis is usually based on evaluation of classic symptoms. Possible diagnostic tests include a complete blood count (CBC), ESR, Electrocardiogram, Echocardiogram, Chest x-ray and urinalysis.

Immediate **treatment** is critical to avoid permanent damage to the coronary arteries and heart. Standard treatment includes high doses of Intravenous gamma globulin. The patient's condition usually greatly improves within 24 hours of treatment.

With early recognition and treatment, **full recovery** can be expected. However, 2% of patients die from complications of coronary blood vessel inflammation. Patients who have had Kawasaki disease should have an echocardiogram every 1-2 years to screen for heart problems.

Microscopic polyangiitis (MPA) is an inflammation of the medium and small vessel walls that can affect different parts of the body including (but not limited to) the kidney, lungs, sinuses. Patients with MPA usually have the disease in their kidney and it is essentially indistinguishable from the kidney disease that patients with classic Wegener's granulomatosis (WG) often have.

The principal difference between MPA and WG is the absence of a specific type of inflammation called granulomatous inflammation that is what distinguishes WG from other forms of vasculitis, although the clinical features are similar in these two diseases. Patients presenting with kidney disease in the absence of disease in other parts of the body are generally classified as "renal-limited" vasculitis.

In the United States, the typical MPA patient is a middle-aged white male or female, but in fact the disease may occur in people of all ages, both genders, and all ethnic backgrounds.

The presenting **symptoms** include fever, joint and muscle pains, weakness, lack of energy and weight loss. Hematuria, the abnormal presence of blood in the urine, swelling and a decrease in the amount of urine may be manifestations of renal involvement which is one of the most frequently involved organs in MPA. In fact approximately 90% of patients with MPH have involvement of their kidneys (called glomerulonephritis, as called because the inflammation affects the part of the kidney that filters fluid to make urine and is called the glomerulous). Lung symptoms like shortness of breath, coughing up blood, and/or chest pain are experienced in about half of the patients. MPA

is the most common cause of the so called pulmonary–renal syndrome, which is the common combination of inflammation and disease symptoms in both the lung and the kidney.

In MPA the symptoms of the upper airway (sinuses, ears) can occur, but are less common or milder than kidney or lung symptoms. The eyes and the nervous system can also affected by the disease. A skin rash, usually with purplish bumps and spots mostly in the lower extremities, is sometimes seen. The stomach and intestinal tract can also be affected by the disease, resulting in pain or an alteration of the color of stools into black or bright red as a result of bleeding.

Over 80% of patients with MPA have ANCA.

The diagnosis of MPA is established with the biopsy, a small piece of tissue that is taken from the affected organ(s). The biopsy tissue is looked at under microscopes and reveals vasculitis. A skin or kidney biopsy is typically preferred, but can also be done in other organs such as the intestine.

The **treatment** of MPA is essentially the same as in WG especially when the major organs injured by the disease are the kidney and/or lung.

Induction therapy is the initial step for all patients diagnosed with MPA in order to reduce the inflammation of the disease. A minimum of three to six months induction phase is needed for most patients to reduce or get rid of the inflammation, which is often known as 'getting the disease into remission."

Maintenance therapy is the following step and is meant to keep the disease in remission as long as possible and therefore reduce the chance that the inflammation will return (called a disease relapse). Maintenance therapy can be continued for 12 to 18 months, sometimes longer. For patients who never completely get their disease into remission or who experience several disease relapses, ongoing maintenance therapy may be continued indefinitely.

Immunosuppressive regimens used in the induction phase of treatment usually include a combination of corticosteroids (prednisone) with either daily oral cyclophosphamide (Cytoxan) or monthly intravenous (given into a vein at a doctor's office or hospital) cyclophosphamide (Cytoxan)**.**

Low-dose weekly oral methotrexate has been tried in patients with MPA without severe inflammation from the disease. Corticosteroids monotherapy is not generally considered for remission induction, since the reported remission rate is much lower. Patients who are dialysis-dependent at presentation seem to benefit from plasmapheresis. Although no controlled studies have been performed, patients with pulmonary hemorrhage may be treated with plasmapheresis also.

Maintenance therapy includes immunosuppressive agents such as mycophenolate mofetil**,** Rituximab**,** azathioprine, methotrexate, Cyclosporine**,** etanercept**.** Trimethoprim-sulfamethoxazole is an antibiotic agent used also relating with the fact that disease activity has been associated with both infection and the chronic nasal carriage of Staphylococcus aureus.

Treatment-associated toxicity: Cyclophosphamide treatment is associated with important toxicity. Women may stop having their menstrual cycles (periods) and men may have lowered or no sperm produced; either of which may not return to normal even after stopping treatment.

Inflammation of the bladder (cystitis), bladder cancer, myelodysplasia, (disorder of the function of the bone marrow, the part of the bone related to the production of blood cells) and lymphoma (type of cancer of the lymph nodes) can also occur with use of this drug. Some studies suggest that monthly intravenous cyclophosphamide (given by vein) may be as effective as daily oral treatment with the same drug in controlling symptoms and reducing inflammation, while reducing the overall cumulative dose and chance of side effects.

Long-term use of corticosteroids use can include cataracts (a clouding of the natural lens, the part of the eye responsible for focusing light and producing clear, sharp images), diabetes mellitus (disorder of the glucose levels in blood), osteoporosis (thin bones), fractures (small breaks in bones), aseptic necrosis of bone (condition in which poor blood supply to an area of bone leads to bone death) and severe pain and inflammation of the stomach.

Pneumonia and other infections are serious complications of any mmunosuppressive therapy, including cyclophosphamide and corticosteroids.

Prophylaxis: Given the toxicities of cyclophosphamide, prophylactic therapy is usually provided with specific drugs to help prevent specific types of pneumonia, permanent loss off periods (menstrual cycles) in women of child-bearing, and bladder cancer.
Given the toxicities of prolonged steroid use, prophylactic treatments may also be provided to help prevent for mouth infections, stomach pain and inflammation and bone loss.

The major lifetime effects in patients with MPA result from the combined effects of irreversible organ damage (such as kidney failure or lung scarring from the disease as well as the consequences of the cumulative dose and total period of each immunosuppressive therapy, whether utilized for initial disease, maintenance of remission, or management of relapses of the disease. Therefore the natural history of the disease is diverse among patients.

Polyarteritis Nodosa (PAN)

Polyarteritis Nodosa (PAN) is a vasculitis disease, which affects the small and medium-sized arteries. PAN commonly affects the skin, heart, kidneys and central nervous system.

Cause: There is no known cause of PAN.

Symptoms include fever, fatigue, weakness, loss of appetite, and weight loss. Muscle and joint aches are common. The skin may show rashes, swelling, ulcers, and lumps.
Other symptoms include abdominal pain and gastrointestinal bleeding (occasionally is mistaken for inflammatory bowel disease). Nerve involvement may cause sensory changes with numbness, pain, burning, and weakness. Central nervous system involvement may cause strokes or seizures. Kidney involvement can produce varying degrees of renal failure. Involvement of the arteries of the heart may cause a heart attack, heart failure, and inflammation of the sack around the heart (pericarditis).

There is **no specific test** to diagnosis PAN. **Diagnosis** is based upon physical examination, lab tests and biopsy of affected area. Most patients with PAN have elevated ESRs. Proteinuria (protein in the urine) is common among patients with kidney involvement.

The American College of Rheumatology 1990 criteria for the classification of Polyarteritis Nodosa

1. Weight loss of > 4 kg since beginning of illness
2. Livedo reticularis
3. Testicular pain or tenderness

4. Myalgias, weakness, or leg tenderness
5. Mononeuropathy or polyneuropathy
6. Development of hypertension
7. Elevated BUN or creatinine unrelated to dehydration or obstruction
8. Presence of hepatitis B surface antigen or antibody in serum
9. Arteriogram demonstrating aneurysms or occlusions of the visceral arteries
10. Biopsy of small or medium-sized artery containing granulocytes

Treatment will vary based on patient symptoms, disease activity, organ involvement and lab test results.

Treatment of PAN has improved dramatically in the past couple of decades. Before the availability of effective therapy, untreated PAN was usually fatal within weeks to months. Most deaths occurred as a result of kidney failure, heart or gastrointestinal complications. However, effective treatment is now available for PAN. After diagnosis, patients are treated with high doses of corticosteroids. Other immunosuppressive drugs are also added for patients who are especially ill. In most cases of PAN now, if diagnosed early enough the disease can be controlled, and often cured.

The newly proposed regimen for patients with PAN associated with hepatitis B, consists of 2 weeks of prednisone to control the vasculitis, followed by plasmapheresis to remove immune complexes, and accompanied by antiviral therapy with lamivudine to rid the patient of the hepatitis B infection. The long–term value of anti–viral therapy for polyarteritis nodosa associated with hepatitis C is not established.

Polymyalgia rheumatica (PMR) is a condition that is frequently linked to giant cell arteritis (GCA) (link). PMR occurs in about 50 % of patients who have GCA, while approximately 15% of patients with PMR develop GCA. There may be a common genetic component between the two disorders. PMR is almost exclusively a disease that affects older adults and is rarely diagnosed in people under the age of 50 years.

Symptoms: Symptoms of PMR almost always include aching and morning stiffness in the shoulders, hips, neck and mid-body. These symptoms usually affect both sides of the body the same, but can be stronger on one side than the other. Having difficulty with pain, stiffness and movement of the shoulders and hips can result in trouble with things such as getting dressed. Some patients also complain of general tiredness, weakness, weight loss (without trying to lose weight), and a low fever (a high spiking fever is rare).

Inflammation in the bones and joints cause the discomfort and stiffness (difficulty in moving) found among patients with PMR. Some patients develop swelling or fluid retention (edema) of the hands, wrists, ankles, and top of the feet. The edema usually occurs with other signs of PMR but can be the only symptom experienced.

Decreased ability to fully move the shoulders, neck and hips is frequent. Muscle strength is usually normal and the tenderness found about the shoulders is more likely due to inflammation in the shoulder bones. However, muscle weakness may become a problem over time because of the lack of use due to pain and stiffness.

The characteristic **laboratory** finding in both PMR and GCA is an elevation in the erythrocyte sedimentation rate. This rate measures how fast a patient's red blood cells settle when placed in a small tube.

Routine x-rays (radiographs) of joints with the disease rarely reveal any abnormalities, while magnetic resonance imaging (MRI) examinations can confirm the presence of inflammation. Ultrasounds and Positron emission tomography (PET scanning) have also been used to confirm the PMR inflammation.

Since there is no specific test for PMR, a checklist that requires a certain group of symptoms and laboratory characteristics is used by doctors to make the diagnosis.
There is considerable overlap between PMR and GCA but patients with "pure" PMR lack the symptoms of GCA. Thus, a biopsy of the temporal artery, which is diagnostic for GCA, is not necessary in patients with PMR unless there are symptoms suggestive of GCA.

Treatment: The beneficial effect of corticosteroids (predinsone) in patients with PMR has been established by a combination of clinical experience and several research studies. Initial treatment most often starts with a dose of prednisone between 7.5 and 20 mg/day. Patients usually respond quickly but the dose is increased if the symptoms are not well controlled within one week. In some patients a single daily dose of prednisone does not provide relief from evening or night-time pain or stiffness while a divided dose (2 times a day, usually 12 hours apart) may be more helpful in reducing symptoms. The effective steroid dose is maintained for 2-4 weeks after the symptoms have resolved. The dose is then gradually lowered and stopped, with careful monitoring for return of symptoms.

Return of symptoms (relapse) occurs in as many as 25-50% of patients. Relapse is more likely to occur if the steroid dose is decreased too fast. If symptoms return, restarting or increasing the dose of corticosteroids is appropriate.

Side effects with corticosteroids: The risk of diabetes (abnormal glucose blood levels) and risk of fractures (small cracks) in the bones of the back, hip and neck are increased, especially with frequent use of this therapy. In patients who require corticosteroid treatment for more than six months, an assessment of bone density is suggested to test for osteoporosis (loss of bone thickness). To help protect bones from fractures and osteoporosis, calcium and vitamin D are often taken regularly, and sometimes drugs such as bisphosphonates are given.

In patients who have side-effects from or a long history of taking corticosteroids, the use of **methotrexate** may allow the corticosteroid dose to be eliminated or lowered, however this has only been suggested by some, but not all, studies. Anti-inflammatory drugs such as ibuprofen can also be used to decrease painful symptoms, especially when symptoms are only mild, and may also help avoid use of corticosteroid treatment

Effort must be focused at control of symptoms with a minimum of drug-induced side effects. In most patients, symptoms of PMR will eventually end (over a period of months to years) and corticosteroid therapy can be discontinued.

Rheumatoid vasculitis (RV) refers to patients with rheumatoid arthritis, a chronic disease with painful inflammation of the joints, who also develop inflammatory disease in small and medium-sized blood vessels. RV most commonly occurs in the skin as venulitis or capillaritis, meaning the very smallest blood vessels are affected by inflammation from the disease. RV occurs in approximately 2 to 5 % of patients who have rheumatoid arthritis.

The **reason** why RV develops in some patients with rheumatoid arthritis and not others is not clear. Genetic factors may be involved. Viral infections and drug reactions have been suggested as causes of RV, but there is little research to support this. Some research suggests that long time use of drugs such as corticosteroids, gold compounds, penicillamine and azathioprine that are used to treat rheumatoid arthritis can cause the development of RV. However, this may not be true and difficult to determine because more use of these drugs is probably because of more severe or long standing rheumatoid arthritis, both of which may also be associated with the development of RV.

RV typically occurs in patients who have had rheumatoid arthritis for a long time. In one study, for example, the average time between the diagnosis of rheumatoid arthritis and the onset of RV symptoms was 13.6 years. Patients with rheumatoid arthritis seem more likely to develop RV when they have high rheumatoid factor levels (a specific laboratory finding for rheumatoid arthritis) and disease of at least one year's duration. Males with rheumatoid arthritis are more likely (2 to 4 times more likely) than females with rheumatoid arthritis to develop RV.

The manifestations of RV can involve many of the body's organs, including the skin, nerves to the hands and feet, blood vessels of the fingers and toes, and the eyes. Skin vasculitis is the most common manifestation of RV, occurring in as many as 90% of patients. Inflammation of the small blood vessels in the skin results in the development of red spots on the skin. When the eyes are involved, there is usually inflammation of the white part of the eye (scleritis).

The heart can also be affected by the disease, which can cause inflammation of the external part of the heart (pericarditis) and abnormal heart rate (arrhythmia). These symptoms put these patients at a higher risk for having a heart attack (myocardial infarction).

Patients with rheumatoid arthritis should see a physician if they develop new or worsened symptoms such as weight loss, fever, and lack of energy, any new symptoms beyond the usual joint symptoms. A blood test for specific antibodies that are directed against the inner layer of blood vessels (endothelial cells) are present in approximately 75% of patients with RV compared to only 15to 20% of those with rheumatoid arthritis
alone. Therefore, this blood test may be checked regularly in patients with any of these new or worsened symptoms.

Diagnosis: Many of the drugs used to treat RV have a number of side effects; therefore it is important to be sure of the diagnosis before treatment is started (see treatment section below). The diagnosis of RV almost always requires a biopsy of tissue affected by the disease; an inflamed nerve or a kidney if there are clinical signs of kidney involvement, for example.

In rare cases RV may affect large blood vessels. If this happens or your doctor thinks it may have happened, then ‘pictures’ will be taken so that the vessels can be evaluated**.** Some of these pictures require that you drink something called ‘contrast’ material. This material shows up on the picture and helps to show different parts of the inside of your body. This test is called contrast angiography and is especially useful to help determine the location and appearance of large vessels that may be affected by the disease.

Biopsy-proven RV, even if only in one organ, requires aggressive therapy. The limited data specifically related to RV suggest that most such patients should be treated with the same or similar drugs that are used in other primary systemic vasculitides such as combination therapy with cytotoxic drugs (usually cyclophosphamide) and corticosteroids. Cyclophosphamide given through the veins (intravenous) once a month has been used with success, although daily oral therapy with the same drug may also be effective.

A variety of different types of corticosteroid **treatment** have been used. Patients with aggressive RV disease are usually begun on pulse methylprednisolone (corticosteroids given through the veins once a day for several days) followed by daily oral prednisone. Other drugs have been explored in patients with RV. Some patients have done well with azathioprine and corticosteroids. However azathioprine may be better used to maintain a remission after initial cyclophosphamide therapy helps to control the disease and its symptoms. Methotrexate and tumor necrosis factor (TNF), also known as infliximab, have also been used. However, some patients have developed RV while on these drugs for the treatment of rheumatoid arthritis. Since RV most often occurs when there is very active rheumatoid arthritis, aggressive treatment usually helps to control symptoms of both rheumatoid arthritis and vasculitis.

Supportive care is also very important. Smoking has been associated with an increased risk for rheumatoid arthritis and for RV. Therefore smoking cessation is essential in any rheumatoid arthritis patient, especially those with RV. Good skin care may also prevent infectious complications of skin rashes in RV.

Limited data are available concerning the outcome of patients with RV, although they usually have worse and more ongoing symptoms than those with rheumatoid arthritis who do not have RV.

Takayasu's arteritis (TA) is a vasculitis that is found more commonly in women than in men, with 80% to 90% of people with the disease being women. People who get the disease are usually between the ages of 10 and 40 years when the disease starts. The disease affects people around the world, but is most common in Asians, especially in Japan.

TA primarily affects the aorta, the major vessel that carries blood that supplies oxygen to the body. Inflammation from the disease may be localized to one small part of the aorta, or may involve the entire length of the vessel. As the disease progresses, other major blood vessels may also become affected with inflammation. The abdominal aorta, the part of the aorta that runs through the middle of the body and supplies blood to the stomach area, and lung arteries are involved in about one half (50%) of patients. The inflammatory process causes the walls of the aorta to become thick, which makes it difficult for blood to flow easily. This can cause many different symptoms because it depends on where in the body the blood flow is affected and which organs may not get all the blood that they need to work right.

The **cause** of or reason that TA develops is not understood, although genetics have been associated with increased frequency in several studies.

Symptoms: Symptoms that are common when TA first develops include lack of energy, weight loss, weakness and low-grade fever. Symptoms that affect the blood vessels take time to develop. As the disease progresses the arms and legs may become cool, and pain may develop with use. Other symptoms include joint pain, muscle weakness and pain, and skin lesions. Symptoms of the disease can also include chest pain, shortness of breath and coughing up blood if the lungs become affected. Shortness of breath can develop if the heart is affected. Anemia (low blood count) is present in most patients and results in a general feeling of weakness and tiredness.

Involvement of the major blood vessel that carries blood to the head and brain (the carotid artery) causes decreased blood flow that can lead to dizziness, fainting, headaches, seizures and difficulties thinking and remembering. Difficulty with seeing may also develop. Stomach pain, diarrhea, and stomach bleeding can result from inflammation in the stomach or intestines. Inflammation of the vessels that supply the heart (coronary arteries) can cause chest pain and puts patients at higher risk of having a heart attack (myocardial infarction).

Diagnosis: In order for doctors to see what is happening to the aorta and other blood vessels, several different types 'pictures' may be taken**.** Radiography (x-ray) of the chest may be used to look for changes in the aorta. Other types of pictures require that you drink or be given a shot of something called 'contrast' material. This material shows up on the picture and helps to show different parts of the inside of your body.

These tests are called contrast angiography or arteriography, and they are especially useful to help determine the location and appearance of vessels affected by the disease.

Computed tomographic (CT) or magnetic resonance (MR) imaging scans of the chest, abdomen, head and neck, or other areas may also be used, particularly so that doctors can evaluate large arteries. Positron emission tomography (PET scanning) can also be used to take pictures of the aorta and other large vessels. Several of these types of tests and pictures may be needed in order to diagnose and manage TA.

The main drug used for **treatment** of TA is corticosteroids, also known as glucocorticoids. Treatment with this medicine usually stops this disease from getting worse by reducing the inflammation associated with the disease. However, use of this medicine, especially for long periods of time, can cause many adverse reactions or side-effects.
Approximately one-half of all patients with TA have disease that is ongoing and does not get completely better with the use of corticosteroids. When this is the case, other drugs such as methotrexate, cyclophosphamide, and azathioprine may reduce inflammation and be helpful in controlling symptoms of the disease. A new drug that may be helpful for patients with TA who do not get better with the treatments listed above is called an anti-tumor necrosis factor alpha (anti-TNF) agent. However, there are not many studies of this type of drug in this disease, although a large study is planned.

Several types of medical procedures may be used to help repair damaged blood vessels and to restore blood flow if major damage from the disease occurs. Angioplasty is a medical procedure in which a balloon is used to open narrowed or blocked blood vessels. A by-pass graft may also be done, which is a surgery performed to redirect a clogged or severely damaged vessel.

Prognosis: TA is a chronic disease. The degree of new disease involvement over time can be quite different between patients, and the inflammation may never completely go away. In some patients the disease eventually 'burns out' and symptoms and inflammation do not ever return.

Wegener's Granulomatosis (WG) is an uncommon disease that affects about 1 in 20,000 to 1 in 30,000 people. Symptoms are due to **inflammation** that can affect many tissues in the body, including blood vessels **(vasculitis).** It is also considered a disease of abnormal immune function.

There is no known cause of WG; but it is **not contagious,** and there is **no evidence it is hereditary.** It is systemic, meaning it affects the body as a whole. It affects the upper (sinuses and nose), and lower (lungs), respiratory system and frequently involves the kidneys, lungs, eyes, ears, throat, skin and other body organs. For reasons not clear, blood vessels in those areas may become inflamed and clusters of certain cells **(granulomas)** may occur.

WG is an uncommon disease, which can occur at any age. It most often occurs in the 4th and 5th decade of life. Patients are divided equally between males and females. It appears that Caucasians are far more commonly affected than other racial groups.

Onset of WG may be indolent, slow moving with few **symptoms**, or have a rapid and severe onset. About **90% of patients** have symptoms of a 'cold' ' 'runny nose' or sinusitis **that fail to respond** to the usual therapeutic measures **and last considerably longer** than the usual upper respiratory tract infection. Other symptoms include nasal membrane ulcerations and crusting, saddle-nose deformity, inflammation of the ear with hearing problems, inflammation of the eye with sight problems, cough (with or without the presence of blood), pleuritis, (inflammation of the lining of the lung), rash and/or skin sores, fever, lack of energy, weakness, fatigue, loss of appetite, weight loss, arthritic joint pain, night sweats, and blood in urine which may or may not be indicated by a change in urine color.

Be aware that **not all** WG patients experience all symptoms. Different patients experience different symptoms, and the severity of the disease is also different for each WG patient. **If any of the above symptoms persist,** consider a possible diagnosis of WG and arrange to have a complete evaluation, including health history, physical exam, laboratory studies, including a urinalysis and an ANCA test.

Diagnosis is established by clinical and laboratory findings such as the ANCA blood test, other blood and urine tests, x-rays, and tissue biopsy, if needed.

The **treatment** of WG can be divided into two stages**:** firstly, the **induction of disease remission,** and secondly, the **maintenance of disease remission.** Medication usually consists of cytotoxic agents (a form of chemotherapy), using relatively low doses of **Cyclophosphamide (Cytoxan),** and/or **Methotrexate** and/or **Azathioprine (Imuran),** and glucocorticoids **(Prednisone).**

Treatment will vary based on patient symptoms, disease activity, organ involvement and lab test results. **Patients with kidney involvement and more severe WG are commonly prescribed Cyclophosphamide and Prednisone as initial treatment.** Ideally, the use of **Cyclophosphamide will be limited to a three to six month period** and then replaced, based on kidney function, by Methotrexate or Azathioprine.

Those with **milder forms of WG are commonly prescribed Methotrexate and Prednisone.** These medications will be reduced over time, and even eliminated, if the patient remains in a stable remission. WG patients may also be prescribed calcium supplements and other medications to prevent osteoporosis from extended prednisone use. Many patients will also be prescribed the antibiotic **Bactrim** to help prevent secondary lung infections with a dangerous “bug” called **Pneumocystis carinii pneumonia (PCP).** In addition, there is some evidence that Bactrim, used cautiously, can have the beneficial effects of reducing relapses and upper airway infections.

Effective treatment should include a **"team approach" with medical specialists** according to the patient's organ involvement. It is common for a WG patient to regularly see the following Doctors: Nephrologist (Kidney), Otolaryngologist (Ear, Nose/Sinus, Throat), Ophthalmologist (Eye), Pulmonologist (Lung), and **always a Rheumatologist or Immunologist.** Other specialists are involved as needed.

There is no cure for Wegener's Granulomatosis, but early diagnosis and proper treatment will be effective and the disease can be brought into remission with complete absence of all signs of disease.

Long-term remission can be induced and maintained with medications, close management and regular lab tests to help monitor the disease. Treatment can produce symptom-free intervals of 5 to 20 years or more. Some patients will achieve a drug-free remission. However, **relapses are common** but can be caught at their earliest and most treatable stage, for most patients, by paying attention to patient symptoms and lab tests. **WG patients in remission must not hesitate to see a doctor if any WG symptoms return or if they are not feeling well.**

Research into new medications, treatment options and the cause of WG are being investigated at leading medical centers throughout the world.
body.

It is also critically important for the medical team to be experienced in treating vasculitis. Because vasculitis is rarely diagnosed, many doctors do not have experience treating patients and may not be familiar with the most up-to-date treatment protocols.

Patients should ask their doctors if they have experience treating vasculitis.

Each medical team needs a "leader" - someone who is going to coordinate with the other team members about medications the patient is taking and the tests/procedures the patient is having.

Online Resources for Patients with Vasculitis

The VF Medical Consultants (a list is included in the printed packet) or online: http://www.vasculitisfoundation.org/node/44 are the most experienced and knowledgeable doctors treating vasculitis. They see patients, perform research, write the medical journal articles and teach the next generation of doctors.

The VF recommends that every patient - newly diagnosed OR "experienced" patients make an appointment with a VF Medical Consultant OR one of their colleagues, for a consultation at one of the Vasculitis Centers.

The Association of American Medical Colleges: http://www.aamc.org/medicalschools.htm provides a list of medical schools in the United States and Canada. Medical schools have divisions/departments for each specialty.

International Medical Associations

Several of the medical associations maintain databases of their members on their websites. They also provide information on the various diseases and complications/symptoms.

American College of Rheumatology: http://www.rheumatology.org/directory/geo.asp
American College of Chest Physicians: http://www.chestnet.org/
American Thoracic Society: http://www.thoracic.org/
American Society of Nephrology: http://www.asn-online.org/
American College of Allergy, Asthma & Immunology: http://www.acaai.org/
American Academy of Allergy, Asthma & Immunology: http://www.aaaai.org/

Medical Institutions treating Patients with Vasculitis

Alabama

University of Alabama – Birmingham Vasculitis Center The Kirlin Clinic (Rheumatology Clinic)
http://www.health.uab.edu/12286/
Phone: 205.801.8187 or 1-800-333-6543 ext.18187

California

University of California – Los Angeles Division of Rheumatology
http://rheumatology.med.ucla.edu

University of California – San Francisco Division of Rheumatology
http://medicine.ucsf.edu/rheum/

Maryland

The Johns Hopkins Vasculitis Center: http://vasculitis.med.jhu.edu/
410.550.6825 or 410.550.6830

Massachusetts

Boston University: The Arthritis Center
http://www.bumc.bu.edu/Dept/Home.aspx?DepartmentID=436
617.638.4310; Fax: 617.638.5226

Massachusetts General Hospital (Rheumatology Associates)
http://www.massgeneral.org/rai/index.asp?page=make_appointment
617.726.7938; Fax: 617.643.1274

Minnesota

Mayo Clinic: (Two locations: Rochester and Jacksonville, FL): www.mayo.edu
- Division of Nephrology: http://www.mayoclinic.org/nephrology-rst/
- Division of Ophthalmology: http://www.mayoclinic.org/ophthalmology-rst/
- Division of Pulmonary and Critical Care: http://www.mayoclinic.org/pulmonary-rst/
  - Rochester: 507.284.2964; Fax: 507.266.4372
  - Jacksonville: http://www.mayoclinic.org/pulmonary-jax/
- Division of Rheumatology: http://www.mayoclinic.org/rheumatology-rst/
  - Phone: 507.284.8450; Fax: 507.284.0564

New Hampshire

Dartmouth University: Rheumatology
http://www.dhmc.org/webpage.cfm?site_id=2&org_id=871&gsec_id=0&sec_id=0&item_id=44560
603.650.8622

New York
NYU Department of Medicine Division of Rheumatology
http://www.med.nyu.edu/medicine/rheumatology/

NYU Department of Medicine Division of Rheumatology
Behcet's Syndrome Center: http://www.med.nyu.edu/medicine/rheumatology/patient/behcets.html
646.356.9400; Fax: 646. 356.9453

Hospital for Special Surgery: Rheumatology
http://www.hss.edu/rheumatology-conditions-treatments.asp
Head and Neck Surgical Group
http://www.entsurg.com/
212.262.4444; 800.NY.NY.ENT; Fax: 212.523.6364

North Carolina
Duke University Rheumatology Clinic
http://www.dukehealth.org/Services/RheumatologyAndImmunology/About/index?search_highlight=rheumatology
919.668.7630 or 888.ASK.DUKE (888.275.3853) toll-free

University of North Carolina: Nephrology and Hypertension: UNC Kidney Center
http://www.unckidneycenter.org/about/geninfo.html

University of North Carolina Division of Rheumatology: The Thurston Arthritis Research Center
http://tarc.med.unc.edu/gen_staff_listing.php

Ohio
Cleveland Clinic Center for Vasculitis Care and Research:
http://www.clevelandclinic.org/arthritis/vasculitis/staff.htm
216.445.6056 or 216.444.5501 or 1.866.320.4573 (toll free)

Pennsylvania
University of Pennsylvania Division of Rheumatology:
http://www.med.upenn.edu/rheum/

Vasculitis Clinical Research Consortium: http://rarediseasesnetwork.epi.usf.edu/vcrc/

INTERNATIONAL

European Vasculitis Study Group (EUVAS): www.vasculitis.org

Groupe Français d'Etude des Vascularites: http://www.vascularite.com/

Rheuma-Klinik Bad Bramstedt: http://www.rheuma-zentrum.de

International Network for the Study of Systemic Vasculitides (INSSYS):
http://www2.ccf.org/inssys/

National Institutes of Health: http://www.nih.gov

Medline Plus: http://www.nlm.nih.gov/medlineplus/aboutmedlineplus.html
Medline Plus will direct you to information to help answer health questions. Medline Plus brings together authoritative information from NLM, the National Institutes of Health (NIH), and other government agencies and health-related organizations. Preformulated MEDLINE searches are included in Medline Plus and give easy access to medical journal articles. Medline Plus also has extensive information about drugs, an illustrated medical encyclopedia, interactive patient tutorials, and latest health news.

MedicineNet.com: http://www.medicinenet.com/script/main/hp.asp
MedicineNet.com is an online, healthcare media publishing company. It provides easy-to-read, in-depth, authoritative medical information for consumers via its robust, user-friendly, interactive web site.

Up-To-Date: http://www.uptodate.com/home/index.html
UpToDate is an evidence based, peer reviewed information resource - available via the Web, desktop, and PDA. With *UpToDate*, you can answer questions quickly, increase your clinical knowledge, and improve patient care. Independent studies confirm these benefits.
unbiased medical information available.

Drug Information: Alendronate (a len' droe nate): Fosamax

Why is this medication prescribed?
[Posted 01/07/2008] FDA informed healthcare professionals and patients of the possibility of severe and sometimes incapacitating bone, joint, and/or muscle (musculoskeletal) pain in patients taking bisphosphonates. Although severe musculoskeletal pain is included in the prescribing information for all bisphosphonates, the association between bisphosphonates and severe musculoskeletal pain may be overlooked by healthcare professionals, delaying diagnosis, prolonging pain and/or impairment, and necessitating the use of analgesics. The severe musculoskeletal pain may occur within days, months, or years after starting a bisphosphonates. Some patients have reported complete relief of symptoms after discontinuing the bisphosphonate, whereas others have reported slow or incomplete resolution. The risk factors for and incidence of severe musculoskeletal pain associated with bisphosphonates are unknown.
Healthcare professionals should consider whether bisphosphonate use might be responsible for severe musculoskeletal pain in patients who present with these symptoms and consider temporary or permanent discontinuation of the drug. For more information visit the FDA website at: http://www.fda.gov/medwatch/safety/2008/safety08.htm#Bisphosphonates and http://www.fda.gov/cder/drug/infopage/bisphosphonates/default.htm.

[Posted 10/01/2007] FDA issued an early communication about the ongoing review of new safety data regarding the association of atrial fibrillation with the use of bisphosphonates. Bisphosphonates are a class of drugs used primarily to increase bone mass and reduce the risk for fracture in patients with osteoporosis, slow bone turnover in patients with Paget's disease of the bone, treat bone metastases, and lower elevated levels of blood calcium in patients with cancer. FDA reviewed spontaneous postmarketing reports of atrial fibrillation reported in association with oral and intravenous bisphosphonates and did not identify a population of bisphosphonate users at increased risk of atrial fibrillation. In addition, as part of the data review for the recent approval of once-yearly Reclast for the treatment of postmenopausal osteoporosis, FDA evaluated the possible association between atrial fibrillation and the use of Reclast (zoledronic acid). Most cases of atrial fibrillation occurred more than a month after drug infusion. Also, in a subset of patients monitored by electrocardiogram up to the 11th day following infusion, there was no significant

difference in the prevalence of atrial fibrillation between patients who received Reclast and patients who received placebo.

Upon initial review, it is unclear how these data on serious atrial fibrillation should be interpreted. Therefore, FDA does not believe that healthcare providers or patients should change either their prescribing practices or their use of bisphosphonates at this time. Pending revision, the material in this section should be considered in light of more recently available information in the MedWatch notification at the beginning of this monograph.

Alendronate is used to treat and prevent osteoporosis (a condition in which the bones become thin and weak and break easily) in women who have undergone menopause (change of life; end of menstrual periods). Alendronate is also used to treat osteoporosis in men and women, who are taking corticosteroids (a type of medication that may cause osteoporosis in some patients). Alendronate is also used to treat Paget's disease of bone (a condition in which the bones are soft and weak and may be deformed, painful, or easily broken). Alendronate is in a class of medications called bisphosphonates. It works by preventing bone breakdown and increasing bone density (thickness).

How should this medicine be used?
Alendronate comes as a tablet and a solution (liquid) to take by mouth. The solution is usually taken on an empty stomach once a week in the morning. The 5-mg and 10-mg tablets are usually taken on an empty stomach once a day in the morning, and the 30-mg and 70-mg tablets are usually taken on an empty stomach once a week in the morning. The 40-mg tablets are usually taken once a day in the morning for six months to treat Paget's disease of bone. Follow the directions on your prescription label carefully, and ask your doctor or pharmacist to explain any part you do not understand. Take alendronate exactly as directed. Do not take more or less of it or take it more often than prescribed by your doctor.

Alendronate may not work properly and may damage the esophagus (tube between the mouth and stomach) or cause sores in the mouth if it is not taken according to the following instructions. Tell your doctor if you do not understand, you do not think you will remember, or you are unable to follow these instructions:

You must take alendronate just after you get out of bed in the morning, before you eat or drink anything. Never take alendronate at bedtime or before you wake up and get out of bed for the day. Swallow alendronate tablets with a full glass (6 to 8 ounces, about 1 cup) of plain water. Drink at least a quarter of a cup (2 ounces) of plain water after you drink alendronate liquid. Never take alendronate with tea, coffee, juice, milk, mineral water, sparkling water, or any liquid other than plain water. Swallow the tablets whole; do not split, chew or crush them. Do not suck on the tablets.

After you take alendronate, do not eat, drink, or take any other medications (including vitamins or antacids) for at least 30 minutes. Do not lie down for at least 30 minutes after you take alendronate. Sit upright or stand upright until at least 30 minutes have passed and you have eaten your first food of the day.

Alendronate controls osteoporosis and Paget's disease of bone but does not cure these conditions. It may take 3 months or longer before your bone density begins to increase. Alendronate helps to treat and prevent osteoporosis only as long as it is taken regularly. Continue to take alendronate even if you feel well. Do not stop taking alendronate without talking to your doctor.

Ask your pharmacist or doctor for a copy of the manufacturer's information for the patient.

Other uses for this medicine
This medication may be prescribed for other uses; ask your doctor or pharmacist for more information.

What special precautions should I follow?
Pending revision, the material in this section should be considered in light of more recently available information in the MedWatch notification at the beginning of this monograph.

Before taking alendronate,
tell your doctor and pharmacist if you are allergic to alendronate, any other medications, or any of the ingredients in alendronate tablets or liquid. Ask your pharmacist for a list of the ingredients.
tell your doctor and pharmacist what prescription and nonprescription medications, vitamins, nutritional supplements, and herbal products you are taking or plan to take. Be sure to mention any of the following: aspirin and other nonsteroidal anti-inflammatory medications (NSAIDs) such as ibuprofen (Advil, Motrin) and naproxen (Naprosyn, Aleve); cancer chemotherapy; or oral steroids such as dexamethasone (Decadron, Dexone), methylprednisolone (Medrol), and prednisone (Deltasone). Your doctor may need to change the doses of your medications or monitor you carefully for side effects.

- if you are taking any other medications including supplements, vitamins, or antacids by mouth, take them at least 30 minutes after you take alendronate.
- tell your doctor if you are unable to sit upright or stand upright for at least 30 minutes and if you have or have ever had a low level of calcium in your blood or any problems with your esophagus. Your doctor may tell you that you should not take alendronate.
- tell your doctor if are undergoing radiation therapy and if you have or have ever had anemia (condition in which the red blood cells do not bring enough oxygen to all the parts of the body); difficulty swallowing; heartburn; ulcers or other stomach problems; cancer; any type of infection, especially in your mouth; problems with your mouth, teeth, or gums; any condition that stops your blood from clotting normally; or dental or kidney disease.
- tell your doctor if you are pregnant or are breast-feeding. Also tell your doctor if you plan to become pregnant at any time in the future, because alendronate may remain in your body for many years after you stop taking it. Call your doctor if you become pregnant during or after your treatment.
- you should know that alendronate may cause serious problems with your jaw, especially if you have dental surgery or treatment while you are taking the medication. A dentist should examine your teeth and perform any needed treatments before you start to take alendronate. Be sure to brush your teeth and clean your mouth properly while you are taking alendronate. Talk to your doctor before having any dental treatments while you are taking this medication.
- you should know that alendronate may cause serious damage to the lining of your mouth, esophagus, or stomach, especially if you do not take it according to the directions listed in the HOW section above. If you experience any of the following symptoms, stop taking alendronate, and call your doctor immediately: new or worsening heartburn, difficulty swallowing, pain on swallowing, or chest pain.
- talk to your doctor about other things you can do to prevent osteoporosis from developing or worsening. Your doctor will probably tell you to avoid smoking and drinking large amounts of alcohol and to follow a regular program of weight-bearing exercise.

What special dietary instructions should I follow?
You should eat and drink plenty of foods and drinks that are rich in calcium and vitamin D while you are taking alendronate. Your doctor will tell you which foods and drinks are good sources of these nutrients and how many servings you need each day. If you find it difficult to eat enough of these foods, tell your doctor. In that case, your doctor can prescribe or recommend a supplement.

What should I do if I forget a dose?
If you miss a dose of once-daily alendronate, do not take it later in the day. Skip the missed dose and take one dose the next morning as usual. If you miss a dose of once-weekly alendronate, take one dose the morning after you remember. Then return to taking one dose once each week on your regularly scheduled day. Never take a double dose to make up for a missed one, and never take more than one dose in 1 day.

What side effects can this medication cause?
Pending revision, the material in this section should be considered in light of more recently available information in the MedWatch notification at the beginning of this monograph.
Alendronate may cause side effects. Tell your doctor if any of these symptoms are severe or do not go away:

nausea
constipation
gas
change in ability to taste food
headache
flu-like symptoms
stomach pain
diarrhea
bloating or fullness in the stomach
bone, muscle, or joint pain
dizziness

Some side effects can be serious. If you experience any of the following symptoms, call your doctor immediately before you take any more alendronate:

new or worsening heartburn
pain on swallowing
bloody vomit or vomit that looks like coffee grounds
fever
rash (may be made worse by sunlight)
hives
throat
hoarseness
loosening of the teeth
poor healing of the jaw
difficulty swallowing
chest pain
black, tarry, or bloody stools
blisters or peeling skin
itching
swelling of eyes, face, lips, tongue, or
difficulty breathing
painful or swollen gums
numbness or heavy feeling in the jaw
eye pain

Alendronate may cause other side effects. Call your doctor if you have any unusual problems while taking this medication.

Symptoms of overdose may include:
heartburn
nausea
stomach pain
bloody vomit or vomit that looks like coffee grounds
difficulty swallowing or pain when swallowing
bloody or black and tarry stool

Excerpted from http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a601011.html

Drug Information: Azathioprine (ay za thye' oh preen): Imuran

Why is this medication prescribed?
Azathioprine is used with other medications to prevent rejection of kidney transplants. It is also used to treat severe rheumatoid arthritis (a condition in which the body attacks its own joints, causing pain and swelling) when other medications and treatments have not helped.

Azathioprine is in a class of medications called immunosuppressants. It works by weakening the body's immune system so it will not attack the transplanted organ or the joints.

How should this medicine be used?
Azathioprine comes as a tablet to take by mouth. It is usually taken once or twice a day after meals. To help you remember to take azathioprine, take it around the same time(s) every day.

Follow the directions on your prescription label carefully, and ask your doctor or pharmacist to explain any part you do not understand. Take azathioprine exactly as directed. Do not take more or less of it or take it more often than prescribed by your doctor.

If you are taking azathioprine to treat rheumatoid arthritis, your doctor may start you on a low dose and gradually increase your dose after 6-8 weeks and then not more than once every 4 weeks. If you are taking azathioprine to prevent kidney transplant rejection, your doctor may start you on a high dose and decrease your dose gradually as your body adjusts to the transplant.

Azathioprine controls rheumatoid arthritis but does not cure it. It may take some time before you feel the full benefit of azathioprine. Azathioprine prevents transplant rejection only as long as you are taking the medication. Continue to take azathioprine even if you feel well. Do not stop taking azathioprine without talking to your doctor.

Other uses for this medicine
Azathioprine is also used to treat ulcerative colitis (a condition in which sores develop in the intestine causing pain and diarrhea). Talk to your doctor about the possible risks of using this drug for your condition.

This medication is sometimes prescribed for other uses; ask your doctor or pharmacist for more information.

What special precautions should I follow?
Before taking azathioprine,

- tell your doctor and pharmacist if you are allergic to azathioprine or any other medications.
- tell your doctor and pharmacist what prescription and nonprescription medications, vitamins, nutritional supplements, and herbal products you are taking.
- Be sure to mention any of the medications mentioned in the IMPORTANT WARNING section and the following: allopurinol (Zyloprim); angiotensin-converting enzyme (ACE) inhibitors such as benazepril (Lotensin), captopril (Capoten), enalapril (Lexxel, Vasotec), fosinopril (Monopril), lisinopril (Prinivil, Zestril), moexipril (Univasc), perindopril (Aceon), quinapril (Accupril), ramipril (Altace), and trandolapril (Mavik, Tarka); anticoagulants ('blood thinners') such as warfarin (Coumadin); antimalarials such as chloroquine (Aralen), hydroxychloroquine (Plaquenil), mefloquine (Lariam), primaquine, proguanil (Malarone), pyrimethamine (Daraprim), and quinine; cancer chemotherapy medications; co-trimoxazole (Bactrim, Septra, Sulfatrim); cyclosporine (Neoral, Sandimmune); gold compounds such as auranofin (Ridaura) and aurothioglucose (Aurolate, Solganal); methotrexate (Rheumatrex); penicillamine (Cuprimine, Depen); sirolimus (Rapamune); and tacrolimus (Prograf).

- tell your doctor if you have any type of infection, or if you have or have ever had kidney, liver, or pancreas disease.
- tell your doctor if you are pregnant, plan to become pregnant, or are breast-feeding. You should use birth control to be sure you or your partner will not become pregnant while you are taking this medication. Do not breastfeed while you are taking this medication.
- if you are having surgery, including dental surgery, tell the doctor or dentist that you are taking azathioprine.
- Do not have any vaccinations (e.g., measles or flu shots) during or after your treatment without talking to your doctor.
- you should know that azathioprine may decrease your ability to fight infection. Stay away from people who are sick, and wash your hands often.

What special dietary instructions should I follow?
Unless your doctor tells you otherwise, continue your normal diet.

What should I do if I forget a dose?
Take the missed dose as soon as you remember it. However, if it is almost time for the next dose, skip the missed dose and continue your regular dosing schedule. Do not take a double dose to make up for a missed one.

What side effects can this medication cause?
Azathioprine may cause side effects. Tell your doctor if any of these symptoms are severe or do not go away:

- upset stomach
- vomiting
- diarrhea
- muscle aches

Some side effects can be serious. The following symptoms are uncommon, but if you experience any of them or those listed in the IMPORTANT WARNING section, call your doctor immediately.

- mouth sores
- cough
- lack of energy
- loss of appetite
- pain in the upper right part of the stomach
- yellowing of the skin or eyes
- flu-like symptoms
- rash
- blurred vision
- stomach pain

Symptoms of overdose may include:

- upset stomach
- vomiting
- diarrhea
- sore throat, fever, chills, and other signs of infection

Excerpted from http://www.nlm.nih.gov/medlineplus/print/druginfo/medmaster/a682167.html

Drug Information: Co-trimoxazole Oral (coe try mox' a zole): Bactrim

Why is this medication prescribed?
Co-trimoxazole is a combination of trimethoprim and sulfamethoxazole, a sulfa drug. It eliminates bacteria that cause various infections, including infections of the urinary tract, lungs (pneumonia), ears, and intestines. It also is used to treat 'travelers' diarrhea.' Antibiotics will not work for colds, flu, or other viral infections.

This medication is sometimes prescribed for other uses; ask your doctor or pharmacist for more information.

How should this medicine be used?
Co-trimoxazole comes as a tablet and a liquid to take by mouth. It usually is taken two times a day but may be taken up to four times a day for severe lung infections. Drink a full glass of water with each dose.

Shake the liquid well before each use to mix the medication evenly. Follow the directions on your prescription label carefully, and ask your doctor or pharmacist to explain any part you do not understand. Take co-trimoxazole exactly as directed. Do not take more or less of it or take it more often than prescribed by your doctor.

What special precautions should I follow?
Before taking co-trimoxazole,
tell your doctor and pharmacist if you are allergic to co-trimoxazole, diuretics ('water pills'), oral diabetes medications, any sulfa drug, or any other drugs.
tell your doctor and pharmacist what prescription and nonprescription medications you are taking, especially methotrexate, phenytoin (Dilantin), warfarin (Coumadin), and vitamins.
tell your doctor if you have or have ever had liver or kidney disease, asthma, severe allergies, or glucose-6-phosphate dehydrogenase (G-6-PD) deficiency (an inherited blood disease).
tell your doctor if you are pregnant, plan to become pregnant, or are breast-feeding. If you become pregnant while taking co-trimoxazole, call your doctor.
plan to avoid unnecessary or prolonged exposure to sunlight and to wear protective clothing, sunglasses, and sunscreen. Co-trimoxazole may make your skin sensitive to sunlight.

What special dietary instructions should I follow?
Co-trimoxazole may cause an upset stomach. Take co-trimoxazole with food.

What should I do if I forget a dose?
Take the missed dose as soon as you remember it. However, if it is almost time for the next dose, skip the missed dose and continue your regular dosing schedule. Do not take a double dose to make up for a missed one.

What side effects can this medication cause?
Co-trimoxazole may cause side effects. Tell your doctor if any of these symptoms are severe or do not go away:

- upset stomach
- vomiting
- loss of appetite

If you experience any of the following symptoms, call your doctor immediately:

- skin rash
- itching
- sore throat
- fever or chills
- mouth sores
- unusual bruising or bleeding
- yellowing of the skin or eyes
- paleness
- joint aches

If you experience a serious side effect, you or your doctor may send a report to the Food and Drug Administration's (FDA) MedWatch Adverse Event Reporting program online at http://www.fda.gov/MedWatch/index.html or by phone 1-800-332-1088.

Excerpted from http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a684026.html

Drug Information: Cyclophosphamide (sye kloe foss' fa mide): Cytoxan

About your treatment
Your doctor has ordered the drug cyclophosphamide to help treat your illness. The drug can be taken by mouth in tablet form or be given by injection into a vein.

This medication is used to treat:

- lymphomas
- multiple myeloma
- leukemias
- mycosis fungoides
- neuroblastoma
- ovarian carcinoma
- retinoblastoma
- breast cancer

This medication is sometimes prescribed for other uses; ask your doctor or pharmacist for more information.

Cyclophosphamide is in a class of drugs known as alkylating agents; it slows or stops the growth of cancer cells in your body. The length of treatment depends on the types of drugs you are taking, how well your body responds to them, and the type of cancer you have.

Other uses for this medicine
Cyclophosphamide is also used to treat bronchogenic carcinoma, small cell lung carcinoma, and other types of cancer. Talk to your doctor about the possible risks of using this drug for your condition.

Precautions

- Before taking cyclophosphamide,
- tell your doctor and pharmacist if you are allergic to cyclophosphamide or any other drugs.
- tell your doctor and pharmacist what prescription and nonprescription medications you are taking, especially aspirin and vitamins.
- tell your doctor if you have or have ever had kidney disease.
- you should know that cyclophosphamide may interfere with the normal menstrual cycle (period) in women and may stop sperm production in men. However, you should not assume that you cannot get pregnant or that you cannot get someone else pregnant. Women who are pregnant or breast-feeding should tell their doctors before they begin taking this drug. You should not plan to have children while receiving chemotherapy or for a while after treatments. (Talk to your doctor for further details.) Use a reliable method of birth control to prevent pregnancy. Cyclophosphamide may harm the fetus.
- while being treated with cyclophosphamide, drink plenty of fluids because this drug can irritate your kidneys and bladder. This precaution is especially important if you have had chemotherapy before.
- do not have any vaccinations (e.g., measles or flu shots) without talking to your doctor.
- you should know that cyclophosphamide has been associated with the development of other types of cancers. Talk with your doctor about the potential risk of developing a new cancer.

Side effects from cyclophosphamide are common and include:

- thinned or brittle hair
- darkened and thickened skin
- blistering skin or acne
- loss of appetite or weight
- Tell your doctor if either of these symptoms is severe or lasts for several hours:
- mouth blistering
- fatigue

If you experience any of the following symptoms, call your doctor immediately:
painful urination or red urine
black, tarry stools
cough
fever
chills
sore throat
nausea and vomiting
unusual bruising or bleeding
congestion
dizziness
shortness of breath
swelling of the feet or ankles
rash

Special instructions
Drink plenty of fluids. Drink about 10 eight-ounce glasses of fluid and urinate frequently during the first 24 hours after treatment to keep your kidneys working.

The most common side effect of cyclophosphamide is a decrease in the number of blood cells.

Your doctor may order tests before, during, and after your treatment to see if your blood cells are affected by the drug.

Excerpted from http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a682080.html

Drug Information: Infliximab (in flix' i mab) injection: Remicade

Why is this medication prescribed?
Infliximab is used to relieve the symptoms of certain autoimmune disorders (conditions in which the immune system attacks healthy parts of the body and causes pain, swelling, and damage) including:

- rheumatoid arthritis (a condition in which the body attacks its own joints, causing pain, swelling, and loss of function) that is also being treated with methotrexate (Rheumatrex, Trexall)
- Crohn's disease (a condition in which the body attacks the lining of the digestive tract, causing pain, diarrhea, weight loss, and fever) that has not improved when treated with other medications
- ulcerative colitis (condition that causes swelling and sores in the lining of the large intestine) that has not improved when treated with other medications,
- ankylosing spondylitis (a condition in which the body attacks the joints of the spine and other areas causing pain and joint damage),
- psoriasis (a skin disease in which red, scaly patches form on some areas of the body),
- psoriatic arthritis (joint pain and swelling and scales on the skin).

Infliximab is in a class of medications called tumor necrosis factor-alpha (TNF-alpha) inhibitors. It works by blocking the action of TNF-alpha, a substance in the body that causes inflammation.

How should this medicine be used?

- Infliximab comes as a powder to be mixed with sterile water and administered intravenously (into a vein) by a doctor or nurse. It is usually given in a doctor's office every 2-8 weeks. It will take about 2 hours for you to receive your entire dose of infliximab.
- Infliximab may cause serious allergic reactions during an infusion and for 2 hours afterward. A doctor or nurse will monitor you during this time to be sure you are not having a serious reaction to the medication. You may be given other medications to treat or prevent reactions to infliximab. Tell your doctor or nurse immediately if you experience any of the following symptoms during or shortly after your infusion: hives; rash; itching; swelling of the face, eyes, mouth, throat, tongue, lips, hands, feet, ankles, or lower legs; difficulty breathing or swallowing; flushing dizziness; fainting; fever; chills; seizures; and chest pain.
- Infliximab may help control your symptoms, but it will not cure your condition. Your doctor will watch you carefully to see how well infliximab works for you. If you have rheumatoid arthritis or Crohn's disease, your doctor may increase the amount of medication you receive, if needed. If you have Crohn's disease and your condition has not improved after 14 weeks, your doctor may stop treating you with infliximab. It is important to tell your doctor how you are feeling during your treatment.

Other uses for this medicine
Infliximab is also sometimes used to treat juvenile arthritis (joint pain and swelling that begins in childhood), and Behcet's syndrome (ulcers in the mouth and on the genitals and inflammation of various parts of the body). Talk to your doctor about the possible risks of using this medication for your condition.

This medication may be prescribed for other uses; ask your doctor or pharmacist for more information.

What special precautions should I follow?
Before using infliximab,

- tell your doctor and pharmacist if you are allergic to infliximab, any medications made from murine (mouse) proteins, or any other medications. Ask your doctor or pharmacist if you don't know whether a medication you are allergic to is made from murine proteins.
- tell your doctor and pharmacist what prescription and nonprescription medications, vitamins, nutritional supplements, and herbal products you are taking or plan to take. Be sure to mention the medications listed in the IMPORTANT WARNING section, anakinra (Kineret) and etanercept (Enbrel). Your doctor may need to change the doses of your medications or monitor you carefully for side effects.
- tell your doctor if you have or have ever had congestive heart failure (condition in which the heart cannot pump enough blood to other parts of the body). Your doctor may tell you not to use infliximab.
- tell your doctor if you have ever been treated with phototherapy (a treatment for psoriasis that involves exposing the skin to ultraviolet light) and if you have or have ever had a disease that affects your nervous system, such as multiple sclerosis (MS; loss of coordination, weakness, and numbness due to nerve damage), Guillain-Barre syndrome (weakness, tingling, and possible paralysis due to sudden nerve damage) or optic neuritis (inflammation of the nerve that sends messages from the eye to the brain); numbness, burning or tingling in any part of your body; seizures; chronic obstructive pulmonary disease (COPD; a group of diseases that affect the lungs and airways); any type of cancer; bleeding problems or diseases that affect your blood; or heart disease.
- tell your doctor if you have or have ever had hepatitis B (a viral liver infection), have been told that you are a carrier (you are not sick, but the virus is still in your blood) of hepatitis B, or have been in close contact with someone who has hepatitis B. If you are a carrier of hepatitis B, your doctor will watch you carefully to be sure you do not develop an active infection while you are taking infliximab.
- tell your doctor if you are pregnant, plan to become pregnant, or are breast-feeding. If you become pregnant while using infliximab, call your doctor. You should not breast-feed while using infliximab.
- if you are having surgery, including dental surgery, tell the doctor or dentist that you are using infliximab.
- do not have any vaccinations without talking to your doctor. Tell your doctor if you have recently received a vaccine. If your child will be using infliximab, be sure that your child has received all the shots that are required for children of his or her age before he or she begins treatment with infliximab.
- if you were treated with infliximab in the past and you are now starting a second course of treatment, you may have a delayed allergic reaction 3-12 days after you receive infliximab. Tell your doctor if you experience any of the following symptoms several days or longer after your treatment: muscle or joint pain; fever; rash; hives; itching; swelling of the hands, face, or lips; difficulty swallowing; sore throat; and headache.

What special dietary instructions should I follow?
Unless your doctor tells you otherwise, continue your normal diet.

What should I do if I forget a dose?
If you miss an appointment to receive an infliximab infusion, call your doctor as soon as possible.

What side effects can this medication cause?

Infliximab may cause side effects. Tell your doctor if any of these symptoms are severe or do not go away:

- stomach pain
- nausea
- heartburn
- headache
- runny nose
- back pain
- white patches in the mouth
- vaginal itching, burning, and pain or other signs of a yeast infection
- flushing

Some side effects can be serious. The following symptoms are uncommon, but if you experience any of them, or those listed in the IMPORTANT WARNING section, call your doctor immediately:

- any type of rash, including a rash on the cheeks or arms that gets worse in the sun
- chest pain
- swelling of the feet, ankles, stomach, or lower legs
- sudden weight gain
- shortness of breath
- blurred vision or vision changes
- weakness in arms or legs
- muscle or joint pain
- numbness or tingling in any part of the body
- seizures
- yellowing of the skin or eyes
- dark colored urine
- loss of appetite
- pain in the upper right part of the stomach
- unusual bruising or bleeding
- blood in stool
- pale skin

Studies have shown that people who use infliximab or similar medications may be more likely to develop lymphoma (cancer that begins in the cells that fight infection) than people who do not take these medications. Patients who have autoimmune diseases are more likely to develop certain types of cancer than people who do not have these conditions. This is especially true if their disease is very active. Using infliximab may increase this risk. People who have COPD may have a higher risk of developing cancer while they are using infliximab than people who do not have this condition. Talk to your doctor about the risk of using infliximab.

Infliximab may cause other side effects. Call your doctor if you have any unusual problems while taking this medication.

If you experience a serious side effect, you or your doctor may send a report to the Food and Drug Administration's (FDA) MedWatch Adverse Event Reporting program online at http://www.fda.gov/MedWatch/index.html or by phone 1-800-332-1088.

Excerpted from http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a604023.html

Drug Information: Mycophenolate: Cellcept

Posted 04/10/2008] FDA informed healthcare professionals that the Agency is investigating a potential association between the use of mycophenolate mofetil (CellCept) and mycophenolate sodium (Myfortic), medicines used to prevent organ rejection, and the development of progressive multifocal leukoencephalopathy (PML), a life-threatening disease. PML is a rare disorder that affects the central nervous system usually occurring in patients with immune systems suppressed by disease or medicines. FDA is reviewing data submitted by Roche, including postmarketing reports it has received of PML in patients who took mycophenolate mofetil or mycophenolate sodium, and the proposed revisions to the CellCept prescribing information. FDA has asked Novartis, the maker of Myfortic, for data on PML cases and to revise the Myfortic prescribing information to include the same information about PML included in the CellCept prescribing information. FDA anticipates it may take about 2 months to complete its review of the postmarketing reports and the proposed revisions to the prescribing information. As soon as the review is completed, FDA will communicate the conclusions and recommendations to the public.

Until further information is available, patients and healthcare professionals should be aware of the possibility of PML, such as localized neurologic signs and symptoms in the setting of a suppressed immune system, including during therapy with CellCept and Myfortic. For more information visit the FDA website at: http://www.fda.gov/medwatch/safety/2008/safety08.htm#mycophenolate and http://www.fda.gov/cder/drug/early_comm/mycophenolate.htm.

Risk of birth defects caused by mycophenolate:

Mycophenolate must not be taken by patients who are pregnant or who may become pregnant. There is a high risk that mycophenolate will cause loss of the pregnancy or will cause the baby to be born with birth defects (problems that are present at birth).

You should not take mycophenolate if you are pregnant or if you may become pregnant. You must have a negative pregnancy test within 1 week of the start of your treatment with mycophenolate. You must use two acceptable forms of birth control together for 4 weeks before you begin to take mycophenolate, at all times during your treatment, and for 6 weeks after you stop taking mycophenolate. Your doctor will tell you which forms of birth control are acceptable. Mycophenolate may decrease the effectiveness of hormonal contraceptives (birth control pills, patches, rings, implants, and injections), so it is especially important to use a second form of birth control along with this type of contraceptive.

Call your doctor right away if you think you are pregnant or if you miss a menstrual period.

Other risks of taking mycophenolate:

Mycophenolate may decrease your ability to fight infection. Wash your hands often and avoid people who are sick while you are taking this medication. If you experience any of the following symptoms, call your doctor immediately: sore throat, fever, chills, cold sores, blisters, swollen glands, extreme tiredness, loss of appetite, tingling or burning in one part of the body, pain or burning during urination, frequent urination, wound or sore that is warm or won't heal, drainage from a skin wound, general weak or sick feeling; white patches in the mouth, and other signs of infection.

Mycophenolate may increase your risk of developing certain types of cancer, including lymphoma (a type of cancer that develops in the lymph system) and skin cancer. Tell your doctor if you or anyone in your family has or has ever had skin cancer. Plan to avoid unnecessary or prolonged exposure to real and artificial sunlight and light therapy and to wear protective clothing, sunglasses, and sunscreen. This will decrease your risk of developing skin cancer. Call your doctor if you experience any of the following symptoms: pain or swelling in the neck, groin, or armpits; a change in the appearance of a mole; skin changes; or sores that do not heal.

Talk to your doctor about the risks of taking mycophenolate.

Why is this medication prescribed?

Pending revision, the material in this section should be considered in light of more recently available information in the MedWatch notification at the beginning of this monograph.

Mycophenolate (Cellcept) is used with other medications to prevent transplant rejection (attack of the transplanted organ by the transplant recipient's immune system) in people who have received kidney, heart, and liver transplants. Mycophenolate (Myfortic) is used with other medications to prevent the body from rejecting kidney transplants. Mycophenolate is in a class of medications called immunosuppressive agents. It works by weakening the body's immune system so it will not attack and reject the transplanted organ.

How should this medicine be used?

Mycophenolate comes as a capsule, a tablet, a delayed-release tablet, and a suspension (liquid) to take by mouth. It is usually taken twice a day on an empty stomach (1 hour before or 2 hours after eating or drinking). Take mycophenolate at about the same times every day, and try to space your doses about 12 hours apart. Follow the directions on your prescription label carefully, and ask your doctor or pharmacist to explain any part you do not understand. Take mycophenolate exactly as directed. Do not take more or less of it or take it more often than prescribed by your doctor.

The medication in the delayed-release tablet is absorbed differently by the body than the medication in the tablet and capsule, so this product cannot be substituted for the others. Each time you have your prescription filled, make sure that you have received the right product. If you think you received the wrong medication, talk to your doctor and pharmacist right away.

Swallow the tablets, delayed-release tablets, and capsules whole; do not split, chew, or crush them. Do not open the capsules.

Do not mix mycophenolate suspension with any other medication.

Be careful not to spill the suspension or to splash it onto your skin. If you do get the suspension on your skin, wash the area well with soap and water. If you get the suspension in your eyes, wash with plain water. Use wet paper towels to wipe up any spills.

Mycophenolate prevents organ transplant rejection only as long as you are taking the medication. Continue to take mycophenolate even if you feel well. Do not stop taking mycophenolate without talking to your doctor.

Other uses for this medicine:

Mycophenolate is also used to treat Crohn's disease (a condition in which the body attacks the lining of the digestive tract, causing pain, diarrhea, weight loss, and fever). Talk to your doctor about the possible risks of using this medication for your condition.

This medication may be prescribed for other uses; ask your doctor or pharmacist for more information.

What special precautions should I follow?

Pending revision, the material in this section should be considered in light of more recently available information in the MedWatch notification at the beginning of this monograph.

Before taking mycophenolate,

- tell your doctor and pharmacist if you are allergic to mycophenolate, mycophenolic acid, or any other medications.
- tell your doctor and pharmacist what other prescription and nonprescription medications, vitamins, nutritional supplements, and herbal products you are taking. Be sure to mention any of the following: activated charcoal; acyclovir (Zovirax); antibiotics; azathioprine (Imuran); cholestyramine (Questran); colestipol (Colestid); ganciclovir (Cytovene); phenytoin (Dilantin); probenecid (Benemid); salicylate pain relievers such as aspirin, choline magnesium trisalicylate (Trisalate), choline salicylate (Arthropan), diflunisal (Dolobid), magnesium salicylate (Doan's, others) and salsalate (Argesic, Disalcid, Salgesic); theophylline (TheoDur); valacyclovir (Valtrex); and valganciclovir (Valcyte). Your doctor may need to change the doses of your medications or monitor you carefully for side effects.
- if you are taking antacids, take them 2 hours before or 4 hours after you take mycophenolate.
- tell your doctor if you have or have ever had Lesch-Nyhan syndrome or Keeley-Seegmiller syndrome (inherited diseases that cause high levels of a certain substance in the blood, joint pain, and problems with motion and behavior); ulcers or any disease that affects your stomach, intestines, or digestive system; any type of cancer; or liver or kidney disease.
- tell your doctor if you are breast-feeding.
- do not have any vaccinations without talking to your doctor.
- ask your doctor if you should get a flu vaccine before or during your treatment because taking mycophenolate increases your risk of infection.
- if you have phenylketonuria (PKU, a inherited condition in which a special diet must be followed to prevent mental retardation), you should know that mycophenolate suspension may be sweetened with aspartame, a source of phenylalanine.

What special dietary instructions should I follow?

Unless your doctor tells you otherwise, continue your normal diet.

What should I do if I forget a dose?

Take the missed dose as soon as you remember it. However, if it is almost time for the next dose, skip the missed dose and continue your regular dosing schedule. Do not take a double dose to make up for a missed one.

What side effects can this medication cause?

Pending revision, the material in this section should be considered in light of more recently available information in the MedWatch notification at the beginning of this monograph.

Mycophenolate may cause side effects. Tell your doctor if any of these symptoms are severe or do not go away:

- diarrhea
- constipation
- stomach pain
- nausea
- vomiting
- difficulty falling asleep or staying asleep
- pain, especially in the back, muscles, or joints
- uncontrollable shaking of a part of the body
- headache
- dizziness
- rash

Some side effects can be serious. If you experience any of the following symptoms or those listed in the IMPORTANT WARNING section, call your doctor immediately:

- swelling of the hands, arms, feet, ankles, or lower legs
- difficulty breathing
- unusual bruising or bleeding
- chest pain
- fast heartbeat
- excessive tiredness
- pale skin
- weakness
- black and tarry stools
- red blood in stools
- bloody vomit
- vomiting material that looks like coffee grounds
- loss of muscle tone

Mycophenolate may cause other side effects. Call your doctor if you have any unusual problems while taking this medication.If you experience a serious side effect, you or your doctor may send a report to the Food and Drug Administration's (FDA) MedWatch Adverse Event Reporting program online http://www.fda.gov/MedWatch/index.html or by phone 1-800-332-1088.

Symptoms of overdose may include:

- stomach pain
- nausea
- vomiting
- diarrhea
- fever, chills, and other signs of infection

Excerpted from http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a601081.html

Drug Information: Prednisone (pred' ni sone)

Why is this medication prescribed?
Prednisone is used alone or with other medications to treat the symptoms of low corticosteroid levels (lack of certain substances that are usually produced by the body and are needed for normal body functioning). Prednisone is also used to treat other conditions in patients with normal corticosteroid levels. These conditions include certain types of arthritis; severe allergic reactions; multiple sclerosis (a disease in which the nerves do not function properly); lupus (a disease in which the body attacks many of its own organs); and certain conditions that affect the lungs, skin, eyes, kidneys blood, thyroid, stomach, and intestines. Prednisone is also sometimes used to treat the symptoms of certain types of cancer. Prednisone is in a class of medications called corticosteroids. It works to treat patients with low levels of corticosteroids by replacing steroids that are normally produced naturally by the body. It works to treat other conditions by reducing swelling and redness and by changing the way the immune system works.

How should this medicine be used?
Prednisone comes as a tablet, a solution (liquid), and a concentrated solution to take by mouth. Prednisone is usually taken with food one to four times a day or once every other day. Your doctor will probably tell you to take your dose(s) of prednisone at certain time(s) of day every day. Your personal dosing schedule will depend on your condition and on how you respond to treatment.

Follow the directions on your prescription label carefully, and ask your doctor or pharmacist to explain any part you do not understand. Take prednisone exactly as directed. Do not take more or less of it or take it more often or for a longer period of time than prescribed by your doctor.
If you are taking the concentrated solution, use the specially marked dropper that comes with the medication to measure your dose. You may mix the concentrated solution with juice, other flavored liquids, or soft foods such as applesauce.

Your doctor may change your dose of prednisone often during your treatment to be sure that you are always taking the lowest dose that works for you. Your doctor may also need to change your dose if you experience unusual stress on your body such as surgery, illness, infection, or a severe asthma attack. Tell your doctor if your symptoms improve or get worse or if you get sick or have any changes in your health during your treatment.

If you are taking prednisone to treat a long-lasting disease, the medication may help control your condition but will not cure it. Continue to take prednisone even if you feel well. Do not stop taking prednisone without talking to your doctor. If you suddenly stop taking prednisone, your body may not have enough natural steroids to function normally. This may cause symptoms such as extreme tiredness, weakness, slowed movements, upset stomach, weight loss, changes in skin color, sores in the mouth, and craving for salt, and may cause death. Call your doctor if you experience these or other unusual symptoms while you are taking decreasing doses of prednisone or after you stop taking the medication.

Other uses for this medicine
Prednisone is also sometimes used with antibiotics to treat a certain type of pneumonia in patients with acquired immunodeficiency syndrome (AIDS). Talk to your doctor about the risks of using this drug for your condition. This medication may be prescribed for other uses; ask your doctor or pharmacist for more information.

What special precautions should I follow?
Before taking prednisone,

- tell your doctor and pharmacist if you are allergic to prednisone, any other medications, or any of the inactive ingredients in prednisone tablets or solutions. Ask your doctor or pharmacist for a list of the inactive ingredients.
- tell your doctor and pharmacist what prescription and nonprescription medications, vitamins, and nutritional supplements you are taking or plan to take. Be sure to mention any of the following: amiodarone (Cordarone, Pacerone); anticoagulants ('blood thinners') such as warfarin (Coumadin); certain antifungals such as fluconazole (Diflucan), itraconazole (Sporanox), ketoconazole (Nizoral) and voriconazole (Vfend);aprepitant (Emend); aspirin; carbamazepine (Carbatrol, Epitol, Tegretol); cimetidine (Tagamet); clarithromycin (Biaxin, in Prevpak); cyclosporine (Neoral, Sandimmune); delavirdine (Rescriptor); diltiazem (Cardizem, Dilacor, Tiazac, others); dexamethasone (Decadron, Dexpak); diuretics ('water pills'); efavirenz (Sustiva); fluoxetine (Prozac, Sarafem); fluvoxamine (Luvox); griseofulvin (Fulvicin, Grifulvin, Gris-PEG); HIV protease inhibitors including atazanavir (Reyataz), indinavir (Crixivan), lopinavir (in Kaletra), nelfinavir (Viracept), ritonavir (Norvir, in Kaletra), and saquinavir (Fortovase, Invirase); hormonal contraceptives (birth control pills, patches, rings, implants, and injections); lovastatin (Altocor, Mevacor); medications for diabetes; nefazodone; nevirapine (Viramune); phenobarbital; phenytoin (Dilantin, Phenytek); rifabutin (Mycobutin), rifampin (Rifadin, Rimactane, in Rifamate); sertraline (Zoloft); troleandomycin (TAO); verapamil (Calan, Covera, Isoptin, Verelan); and zafirlukast (Accolate).Your doctor may need to change the doses of your medications or monitor you carefully for side effects.
- tell your doctor what herbal products you are taking or plan to take, especially St. John's wort.
- tell your doctor if you have an eye infection now or have ever had eye infections that come and go and if you have or have ever had threadworms (a type of worm that can live inside the body); diabetes; high blood pressure; emotional problems; mental illness; myasthenia gravis (a condition in which the muscles become weak); osteoporosis (condition in which the bones become weak and fragile and can break easily); seizures; tuberculosis (TB); ulcers; or liver, kidney, intestinal, heart, or thyroid disease.
- tell your doctor if you are pregnant, plan to become pregnant, or are breast-feeding. If you become pregnant while taking prednisone, call your doctor.
- if you are having surgery, including dental surgery, or need emergency medical treatment, tell the doctor, dentist, or medical staff that you are taking or have recently stopped taking prednisone. You should carry a card or wear a bracelet with this information in case you are unable to speak in a medical emergency.
- do not have any vaccinations (shots to prevent diseases) without talking to your doctor.
- you should know that prednisone may decrease your ability to fight infection and may prevent you from developing symptoms if you get an infection. Stay away from people who are sick and wash your hands often while you are taking this medication. Be sure to avoid people who have chicken pox or measles. Call your doctor immediately if you think you may have been around someone who had chicken pox or measles.

What special dietary instructions should I follow?
Your doctor may instruct you to follow a low-salt, high potassium, or high calcium diet. Your doctor may also prescribe or recommend a calcium or potassium supplement. Follow these directions carefully. Talk to your doctor about eating grapefruit and drinking grapefruit juice while you are taking this medication.

What should I do if I forget a dose?
When you start to take prednisone, ask your doctor what to do if you forget to take a dose. Write down these instructions so that you can refer to them later. Call your doctor or pharmacist if you miss a dose and do not know what to do. Do not take a double dose to make up for a missed dose.

What side effects can this medication cause?
Prednisone may cause side effects. Tell your doctor if any of these symptoms are severe or do not go away:

- headache
- dizziness
- difficulty falling asleep or staying asleep
- inappropriate happiness
- extreme changes in mood
- changes in personality
- bulging eyes
- acne
- thin, fragile skin
- red or purple blotches or lines under the skin
- slowed healing of cuts and bruises
- increased hair growth
- changes in the way fat is spread around the body
- extreme tiredness
- weak muscles
- irregular or absent menstrual periods
- decreased sexual desire
- heartburn
- increased sweating

Some side effects can be serious. If you experience any of the following symptoms, call your doctor immediately:
eye pain, redness, or tearing depression
sore throat, fever, chills, cough, or other signs of infection
loss of contact with reality
muscle twitching or tightening
cannot control
in the face, arms, legs, feet, or hands
vomiting
irregular heartbeat
shortness of breath, especially during the night
swelling or pain in the stomach
vision problems
seizures
confusion
shaking of the hands that you
numbness, burning, or tingling
upset stomach
lightheadedness
sudden weight gain
dry, hacking cough
rash
swelling of the eyes, face, lips, tongue, throat, arms, hands, feet, ankles, or lower legs
difficulty breathing or swallowing
itching
hives
depression

Prednisone may slow growth and development in children. Your child's doctor will watch his or her growth carefully. Talk to your child's doctor about the risks of giving prednisone to your child.

Prednisone may increase the risk that you will develop osteoporosis. Talk to your doctor about the risks of taking prednisone and about things that you can do to decrease the chance that you will develop osteoporosis.

Some patients who took prednisone or similar medications developed a type of cancer called Kaposi's sarcoma. Talk to your doctor about the risks of taking prednisone.

Prednisone may cause other side effects. Call your doctor if you have any unusual problems while you are taking this medication.

If you experience a serious side effect, you or your doctor may send a report to the Food and Drug Administration's (FDA) MedWatch Adverse Event Reporting program online at http://www.fda.gov/MedWatch/index.html or by phone1-800-332-1088.

Excerpted from http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a604023.html

Drug Information: Rituximab (ri tux' i mab) Injection

IMPORTANT WARNING: Some people who received rituximab experienced severe reactions to the medication. Some of these people died within 24 hours after they received a dose of rituximab. Most of these deaths happened after the first dose of rituximab. Tell your doctor if you have or have ever had chronic lymphocytic leukemia (CLL; a type of cancer that begins in the white blood cells), mantle cell lymphoma (a fast-growing cancer that begins in the cells of the immune system), an irregular heartbeat, or heart or lung disease. If you have any of these conditions, or if you are female, there is a greater chance that you will experience a serious reaction to rituximab. If you experience any of the following symptoms, tell your doctor or other health care provider immediately: hives; swelling of the lips, tongue, or throat; difficulty breathing or swallowing; dizziness; fainting; shortness of breath, wheezing; blurred vision; headache; pounding or irregular heartbeat; fast or weak pulse; loss of consciousness, fast breathing; pale or bluish skin; pain in the chest that may spread to other parts of the upper body; weakness; excessive tiredness; sweating; or anxiety. When rituximab is used to treat non-Hodgkin's lymphoma (NHL; a type of cancer that begins in a type of white blood cells that normally fight infection) it may cause a condition called tumor lysis syndrome (TLS; a group of symptoms caused by the fast breakdown of cancer cells). TLS may cause kidney failure and the need for dialysis treatment. Tell your doctor if you are also receiving cisplatin (Platinol). If you notice that you need to urinate less often than usual or that you produce less urine than usual, tell your doctor immediately. Rituximab has caused severe skin reactions. These reactions have caused death. If you experience any of the following symptoms, tell your doctor immediately: painful sores, ulcers, blisters, rash, or peeling skin. Some people who received rituximab developed progressive multifocal leukoencephalopathy (PML; a rare infection of the brain that cannot be treated, prevented, or cured and that usually causes death or severe disability) during or after their treatment. If you experience any of the following symptoms, call your doctor immediately: difficulty thinking clearly or walking, loss of strength, vision problems, or any other unusual symptoms that develop suddenly. Talk to your doctor about the risks of using rituximab.

Why is this medication prescribed?
Rituximab is used alone or with other medications to treat certain types of non-Hodgkin's lymphoma (NHL; a type of cancer that begins in a type of white blood cells that normally fights infection). Rituximab is also used with another medication to treat the symptoms of rheumatoid arthritis (RA; a condition in which the body attacks its own joints, causing pain, swelling, and loss of function) in people who have already been treated with a certain type of medication called a tumor necrosis factor (TNF) inhibitor. Rituximab is in a class of medications called biologic antineoplastic agents. It treats NHL by causing the death of blood cells that have multiplied abnormally. It treats rheumatoid arthritis by causing the death of certain blood cells that may cause the immune system to attack the joints.

How should this medicine be used?
Rituximab comes as a solution (liquid) to be injected into a vein. Rituximab is administered by a doctor or nurse in a medical office or infusion center. When rituximab is used to treat rheumatoid arthritis, it is usually given as 2 doses spaced 2 weeks apart. When rituximab is used to treat NHL it is either given once a week for 4-8 weeks or on the first day of each chemotherapy cycle. Your dosing schedule will depend on the condition that you have, the other medications you are using, and how well your body responds to treatment.

Rituximab must be given slowly. It may take several hours or longer to receive your first dose of rituximab, so you should plan to spend most of the day at the medical office or infusion center. After the first dose, you may receive your medication more quickly, depending on how you respond to treatment.

You may experience symptoms such as fever, shaking chills, tiredness, headache, or nausea while you are receiving a dose of rituximab, especially the first dose. Tell your doctor or other healthcare provider if you experience these symptoms while you are receiving your medication. Your doctor may prescribe other medications to help prevent or relieve these symptoms. Your doctor may tell you to take these medications before you receive each dose of rituximab.
Ask your pharmacist or doctor for a copy of the manufacturer's information for the patient.

Other uses for this medicine
This medication may be prescribed for other uses; ask your doctor or pharmacist for more information.

What special precautions should I follow?
Before using rituximab,

- tell your doctor and pharmacist if you are allergic to rituximab or any other medications.
- tell your doctor and pharmacist what prescription and nonprescription medications, vitamins, nutritional supplements, and herbal products you are taking or plan to take. Be sure to mention the medication in the IMPORTANT WARNING section and either of the following: medications for high blood pressure and other medications for rheumatoid arthritis. Your doctor may need to change the doses of your medications or monitor you carefully for side effects.
- tell your doctor if you have any of the conditions mentioned in the IMPORTANT WARNING section and if you have or have ever had hepatitis B or other viruses such as chicken pox, herpes (a virus that may cause cold sores or outbreaks of blisters in the genital area), West Nile virus (a virus that is spread through mosquito bites and may cause serious symptoms), or cytomegalovirus (a common virus that usually only causes serious symptoms in people who have weakened immune systems or who are infected at birth). Also tell your doctor if you have any type of infection now or if you have or have ever had an infection that would not go away or an infection that comes and goes.
- tell your doctor if you are pregnant or plan to become pregnant. Rituximab may harm the fetus. You should use birth control to prevent pregnancy during your treatment with rituximab and for up to 12 months after your treatment. Talk to your doctor about types of birth control that will work for you. If you become pregnant while using rituximab, call your doctor.
- tell your doctor if you are breast-feeding. You should not breast-feed during your treatment with rituximab or for some time after your treatment
- if you are having surgery, including dental surgery, tell the doctor or dentist that you are using rituximab.
- you should know that you may be drowsy or dizzy after you receive a dose of rituximab. Do not drive a car or operate machinery until you know how this medication affects you. Plan to

have someone else drive you home from the medical office or infusion center after you receive your treatment.
- ask your doctor whether you should receive any vaccinations before you begin your treatment with rituximab. Do not have any vaccinations during your treatment without talking to your doctor.

What special dietary instructions should I follow?
Unless your doctor tells you otherwise, continue your normal diet.

What should I do if I forget a dose?
If you miss an appointment to receive rituximab, call your doctor right away.

What side effects can this medication cause?
Rituximab may cause side effects. Tell your doctor if any of these symptoms are severe or do not go away:

- nausea
- vomiting
- diarrhea
- heartburn
- weight gain
- muscle or back pain
- flushing
- night sweats
- tiredness
- weakness
- numbness, burning or tingling in the hands or feet
- runny nose

Some side effects can be serious. If you experience any of these symptoms or those listed in the IMPORTANT WARNING section, call your doctor immediately:

- stomach area pain
- unusual bruising or bleeding
- sore throat, fever, chills, or other signs of infection
- chest tightness
- joint pain or soreness

Rituximab may cause other side effects. Call your doctor if you have any unusual problems while using this medication.

Excerpted from *http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a607038.html*

Medical Encyclopedia: Peripheral neuropathy

Alternative names
Peripheral neuritis; Neuropathy - peripheral; Neuritis - peripheral

Definition
Peripheral neuropathy is a problem with the nerves that carry information to and from the brain and spinal cord. This produces pain, loss of sensation, and inability to control muscles.
"Peripheral" means nerves beyond the brain and spinal cord.
"Neuro" means nerves.
"Pathy" means abnormal.

Causes, incidence, and risk factors
The peripheral nerves relay information from your central nervous system (brain and spinal cord) to muscles and other organs and from your skin, joints, and other organs back to your brain.

Peripheral neuropathy occurs when these nerves fail to function properly, resulting in pain, loss of sensation, or inability to control muscles.

In some cases, the failure of nerves that control blood vessels, intestines, and other organs results in abnormal blood pressure, digestion problems, and loss of other basic body processes.

Peripheral neuropathy may involve damage to a single nerve or nerve group (mononeuropathy) or may affect multiple nerves (polyneuropathy).

There are numerous reasons for nerves to malfunction. In some cases, no cause can be identified.

Some people have a hereditary predisposition for neuropathy.

Prolonged pressure on a nerve is another risk for developing a nerve injury. Pressure injury may be caused by prolonged immobility (such as a long surgical procedure or lengthy illness) or compression of a nerve by casts, splints, braces, crutches, or other devices.

Symptoms
The symptoms depend on which type of nerve is affected. The three main types of nerves are sensory, motor, and autonomic. Neuropathy can affect any one or a combination of all three types of nerves. Symptoms also depend on whether the condition affects the whole body or just one nerve (as from an injury).

Sensation Changes
Damage to sensory fibers results in changes in sensation, burning sensations, nerve pain, tingling or numbness, or an inability to determine joint position, which causes in-coordination. For many neuropathies, sensation changes often begin in the feet and progress toward the center of the body with involvement of other areas as the condition worsens.

Movement Difficulties
Damage to the motor fibers interferes with muscle control and can cause weakness, loss of muscle bulk, and loss of dexterity. Sometimes, cramps are a sign of motor nerve involvement.
Other muscle-related symptoms include:
Lack of muscle control
Difficulty or inability to move a part of the body (paralysis)
Muscle atrophy

Muscle twitching (fasciculation) or cramping
Difficulty breathing or swallowing
Falling (from legs buckling or tripping over toes)
Lack of dexterity (such as being unable to button a shirt)

Autonomic Symptoms
The autonomic nerves control involuntary or semi-voluntary functions, such as control of internal organs and blood pressure. Damage to autonomic nerves can cause:

- Blurred vision
- Decreased ability to sweat
- Dizziness that occurs when standing up or fainting associated with a fall in blood pressure
- Heat intolerance with exertion (decreased ability to regulate body temperature)
- Nausea or vomiting after meals
- Abdominal bloating (swelling)
- Feeling full after eating a small amount (early satiety)
- Diarrhea
- Constipation
- Unintentional weight loss (more than 5% of body weight)
- Urinary incontinence
- Feeling of incomplete bladder emptying
- Difficulty beginning to urinate (urinary hesitancy)
- Male impotence

Signs and tests
A detailed history will be needed to determine the cause of the neuropathy. Neurologic examination may reveal abnormalities of movement, sensation, or organ function. Changes in reflexes and muscle bulk may also be present.

Tests that reveal neuropathy may include:

- EMG (a recording of electrical activity in muscles)
- Nerve conduction tests
- Nerve biopsy
- Blood tests to screen for medical conditions, such as diabetes and vitamin deficiency, among others.

Tests for neuropathy are guided by the suspected cause of the disorder, as suggested by the history, symptoms, and pattern of symptom development. They may include various blood tests, x-rays, scans, or other tests and procedures.

Treatment
The first steps of treatment are to identify and treat the underlying medical problem (such as diabetes) or remove the cause (such as alcohol). Other goals include controlling symptoms, curing the disorder if possible, and helping the patient gain maximum independence and self-care ability.

Physical therapy, occupational therapy, and orthopedic interventions may be recommended. For example, exercises and retraining may be used to increase muscle strength and control.

Wheelchairs, braces, and splints may improve mobility or the ability to use an affected arm or leg. Safety is an important consideration for people with neuropathy. Lack of muscle control and reduced sensation increase the risk of falls and other injuries. The person may not notice a potential source of injury because he or she can't feel it. For this reason, people with decreased

sensation should check their feet or other affected areas frequently for bruises, open skin areas, or other injuries, which may go unnoticed (because there is no pain) and become severely infected. Often, a podiatrist can determine if special orthotic devices are needed.

Safety measures for people experiencing difficulty with movement may include railings, various appliances, removing obstacles such as loose rugs, and other measures as appropriate. Safety measures for people having difficulty with sensation include adequate lighting (including lights left on at night), testing water temperature before bathing, use of protective shoes (no open toes, no high heels, and so on) and similar measures. Shoes should be checked often for grit or rough spots that may cause injury to the feet.

People with neuropathy (especially those with polyneuropathy or mononeuropathy multiplex) are prone to new nerve injury at pressure points (knees and elbows, for example). They should avoid prolonged pressure on these areas from leaning on the elbows, crossing the knees, or assuming similar positions.

Over-the-counter or prescription pain medications may be needed to control nerve pain. Anticonvulsants (phenytoin, carbamazepine, gabapentin, and pregabalin), tricyclic antidepressants (duloxetine), or other medications may be used to reduce the stabbing pains that some people experience. Use the lowest dose possible to avoid side effects.

Adjusting position, using frames to keep bedclothes off tender body parts, or other measures may also be helpful to reduce pain.

The symptoms of autonomic changes will be treated. However, they may be difficult to treat or respond poorly to treatment.

Postural hypotension (low blood pressure) -- use of elastic stockings and sleeping with the head elevated may help. Fludrocortisone or similar medications may be beneficial in reducing postural hypotension for some people.

Reduced gastric motility -- medications that increase gastric motility (such as metoclopramide), eating small frequent meals, sleeping with the head elevated, or other measures may help.

Bladder dysfunction -- manual expression of urine (pressing over the bladder with the hands), intermittent catheterization, or medications such as bethanechol may be necessary. Impotence, diarrhea, constipation or other symptoms are treated as appropriate.

Expectations (prognosis)
The outcome greatly depends on the cause of the neuropathy. In cases where a medical condition can be identified and treated, the outlook may be excellent. However, in severe neuropathy, nerve damage can be permanent, even if the cause is treated appropriately. For most hereditary neuropathies, there is no cure. Some of these conditions are harmless, while others progress more rapidly and may lead to permanent, severe complications.

Complications
The inability to feel or notice injuries can lead to infection or structural damage. Changes include poor healing, loss of tissue mass, tissue erosions, scarring, and deformity. Other complications include:

Partial or complete loss of movement (or control of movement)
Partial or complete loss of sensation

Difficulty breathing
Difficulty swallowing
Cardiac arrhythmias (uncommon)
Decreased self esteem
Relationship problems related to impotence
Recurrent or unnoticed injury to any part of the body

Calling your health care provider
Call your health care provider if symptoms of peripheral neuropathy are present. In all cases, early diagnosis and treatment increases the possibility that symptoms can be controlled.
Nerve pain, such as that caused by peripheral neuropathy, can be difficult to control. If pain is severe, contact a pain specialist to make sure you get the best and most up-to-date pain treatment. Emergency symptoms include irregular or rapid heartbeats, difficulty breathing, difficulty swallowing, and fainting.

Prevention
If a prolonged procedure or immobility is expected, appropriate measures (such as padding vulnerable areas) can be taken beforehand to reduce the risk of nerve problems.
Some people have a hereditary predisposition for neuropathy. Such people need to be especially careful to limit alcohol and manage other medical problems closely. All people can reduce the risk of neuropathy through a balanced diet, drinking alcohol in moderation, and maintaining good control of diabetes and other medical problems, if present.

Excerpted from http://www.nlm.nih.gov/medlineplus/ency/article/000593.htm

Medical Encyclopedia: ANCA

There are several types of small-vessel vasculitis and they are all related. Now an animal model proves that some types of ANCA can cause vasculitis, with new research in this area currently underway.

What are ANCA? ANCA cause neutrophils and monocytes (white blood cells) to damage blood vessels. ANCA are autoantibodies found in small-vessel vasculitis: Anti-Neutrophil Cytoplasmic Antibodies. These words mean that there is an antibody to the cytoplasm of neutrophils. ANCA are present in several types of small-vessel vasculitis, including microscopic polyangiitis, Wegener's Granulomatosis and Churg-Strauss syndrome.

Let's look at the meaning of these words:

- **Anti-** means "against."
- **Neutrophils** are a type of white blood cell containing granules filled with potent chemicals that fight infection. These chemicals play a key role in acute or inflammatory reactions.
- **Cytoplasmic** refers to the part of the cell outside the nucleus or center of the cell.
- **Autoantibodies** are proteins secreted by a type of immune cell that recognizes foreign substances.

ANCA are used to help in the diagnosis of small-vessel vasculitis. ANCA react to two chemicals inside normal neutrophils. These two chemicals are called myeloperoxidase (the protein that makes pus green) and proteinease 3 (an enzyme that chews up elastic tissue).

You may have one of two types of ANCA:
1. ANCA directed against myeloperoxidase- called myeloperoxidase ANCA, which is sometimes referred to as “MPO-ANCA.”
2. ANCA directed against proteinease 3-called proteinease 3 ANCA, which is sometimes referred to as “PR3-ANCA.”

Medical Encyclopedia: Fatigue

Alternative names
Tiredness; Weariness; Exhaustion; Lethargy

Definition
Fatigue is a feeling of weariness, tiredness, or lack of energy.

Considerations
Fatigue is different from drowsiness. In general, drowsiness is feeling the need to sleep, while fatigue is a lack of energy and motivation. Drowsiness and apathy (a feeling of indifference or not caring about what happens) can be symptoms of fatigue.

Fatigue can be a normal and important response to physical exertion, emotional stress, boredom, or lack of sleep. However, it can also be a nonspecific sign of a more serious psychological or physical disorder. When fatigue is not relieved by enough sleep, good nutrition, or a low-stress environment, it should be evaluated by your doctor. Because fatigue is a common complaint, sometimes a potentially serious cause may be overlooked.

The pattern of fatigue may help your doctor determine its underlying cause. For example, if you wake up in the morning rested but rapidly develop fatigue with activity, you may have an ongoing physical condition like an underactive thyroid. On the other hand, if you wake up with a low level of energy and have fatigue that lasts throughout the day, you may be depressed.

Common Causes
There are many possible physical and psychological causes of fatigue. Some of the more common are:

- An allergy that leads to hay fever or asthma
- Anemia (including iron deficiency anemia)
- Depression or grief
- Persistent pain
- Sleep disorders such as ongoing insomnia, obstructive sleep apnea, or narcolepsy
- Underactive thyroid or overactive thyroid
- Use of alcohol or illegal drugs like cocaine, especially with regular use
- Fatigue can also accompany the following illnesses:
- Addison's disease
- Anorexia or other eating disorders
- Arthritis, including juvenile rheumatoid arthritis
- Autoimmune diseases such as lupus
- Cancer
- Chronic liver or kidney disease
- Congestive heart failure
- Diabetes

- Infection, especially one that takes a long time to recover from or treat such as bacterial endocarditis (infection of the heart muscle or valves), parasitic infections, AIDS, tuberculosis, and mononucleosis
- Malnutrition
- Certain medications may also cause drowsiness or fatigue, including antihistamines for allergies, blood pressure medicines, sleeping pills, steroids, and diuretics.
- Chronic fatigue syndrome (CFS) is a condition that starts with flu-like symptoms and lasts for 6 months or more. All other possible causes of fatigue are eliminated before this diagnosis is made. Little relieves CFS, including rest.

Home Care

Here are some tips for reducing fatigue:

- Get adequate, regular, and consistent amounts of sleep each night.
- Eat a healthy, well-balanced diet and drink plenty of water throughout the day.
- Exercise regularly.
- Learn better ways to relax. Try yoga or meditation.
- Maintain a reasonable work and personal schedule.
- Change your stressful circumstances, if possible. For example, switch jobs, take a vacation, and deal directly with problems in a relationship.
- Take a multivitamin. Talk to your doctor about what is best for you.
- Avoid alcohol, nicotine, and drug use.

If you have chronic pain or depression, treating either often helps address the fatigue. However, some antidepressant medications may cause or worsen fatigue. Your medication may have to be adjusted to avoid this problem. DO NOT stop or change any medications without instruction from your doctor.

Stimulants (including caffeine) are NOT effective treatments for fatigue, and can actually make the problem worse when the drugs are stopped. Sedatives also tend to worsen fatigue in the long run.

Call your doctor right away if:

- You are confused or dizzy
- You have blurred vision
- You have little to no urine, or recent swelling and weight gain
- Call your doctor if:
- You have ongoing, unexplained weakness or fatigue, especially if accompanied by fever or unintentional weight loss
- You have constipation, dry skin, weight gain, or intolerance to cold
- You wake up and fall back to sleep multiple times through the night
- You have headaches
- You are taking any medications, prescription or non-prescription, or using drugs that may cause fatigue or drowsiness
- You feel sad or depressed
- You have insomnia

What to expect at your health care provider's office

Your doctor will obtain your medical history and perform a complete physical examination, with special attention to your heart, lymph nodes, and thyroid. He or she may ask questions about your lifestyle, habits, and feelings.

Questions may include:

- How long have you had fatigue?
- Did it develop recently or awhile ago?
- Have you had fatigue in the past? If so, does it tend to occur in regular cycles?
- How many hours do you sleep each night? From when until when?
- Do you awake feeling rested or fatigued? Do you have trouble falling asleep? Do you awake during the night?
- Do you snore or does someone who sleeps nearby tell you that you snore?
- Do you feel fatigued or tired throughout the day? Does it tend to get worse as the day goes on or stays about the same?
- Do you feel bored, stressed, unhappy, or disappointed?
- How are your relationships?
- Has anyone in your life recently passed away?
- Have you had more activity (mental or physical) lately?
- What is your diet like?
- Do you get regular exercise?
- Do you have any other symptoms like pain, headaches, or nausea?
- Have you had any recent change in appetite (up or down) or weight (up or down)?
- Do you fall asleep uncontrollably during the day?
- Do you take any prescription or non-prescription medications? Which ones?

Diagnostic tests that may be performed include the following:
Blood tests for anemia, thyroid function, and possible infection.
Urinalysis

Excerpted from http://www.nlm.nih.gov/medlineplus/ency/article/003088.htm

Medical Encyclopedia: Creatinine - urine

Alternative names
Urine creatinine test

Definition
Creatinine is a breakdown product of creatine, which is an important part of muscle. Creatinine is removed from the body entirely by the kidneys. A test can be done that measures the amount creatinine in your urine.

A blood test can also be used to determine your creatinine level.

How the test is performed
A random urine sample or 24-hour collection may used.
If a 24-hour urine sample is needed:
On day 1, urinate into the toilet when you get up in the morning.
Afterwards, collect all urine in a special container for the next 24 hours.
On day 2, urinate into the container when you get up in the morning.
Cap the container. Keep it in the refrigerator or a cool place during the collection period. Label the container with your name, the date, the time of completion, and return it as instructed.

For an infant, thoroughly wash the area around the urethra. Open a urine collection bag (a plastic bag with an adhesive paper on one end), and place it on the infant. For males, place the entire penis in the bag and attach the adhesive to the skin. For females, place the bag over the labia. Diaper as usual over the secured bag.

This procedure may take a couple of attempts -- lively infants can move the bag, causing the urine to be absorbed by the diaper. Check the infant frequently and change the bag after the infant has urinated into it. Drain the urine from the bag into the container provided by your health care provider. Deliver it to the laboratory or your health care provider as soon as possible upon completion.

How to prepare for the test
No special preparation is necessary, but if the sample is being taken from an infant, a couple of extra collection bags may be necessary.

Your health care provider may tell you to temporarily stop taking certain medicines that may interfere with test results. Such medicines include:

- Cephalosporins (cefoxitin)
- Cimetidine
- Cisplatin
- Gentamicin

How the test will feel
The test involves only normal urination, and there is no discomfort.

Why the test is performed
This test can be used as a screening test to evaluate kidney function. It may also be used part of the creatinine clearance test.

Normal Values
Urine creatine (24-hour sample) values can range from 500 to 2000 mg/day. Results are highly dependent on your age and amount of lean body mass.
Note: Normal value ranges may vary slightly among different laboratories. Talk to your doctor about the meaning of your specific test results.

What abnormal results mean
Abnormal results of urine creatinine and creatinine clearance are often non-specific, but may be due to any of the following conditions:

- Glomerulonephritis
- High meat diet
- Kidney failure
- Muscular dystrophy (late stage)
- Myasthenia gravis
- Prerenal azotemia
- Pyelonephritis
- Reduced kidney blood flow (as in shock or congestive heart failure)
- Rhabdomyolysis
- Urinary tract obstruction

What the risks are
There are essentially no risks.

Update Date: 10/22/2007
Updated by: Robert Mushnick, M.D., Clinical Assistant Professor, Department of Nephrology, SUNY Downstate Health Center, Brooklyn, NY. Review provided by VeriMed Healthcare Network

Excerpted from http://www.nlm.nih.gov/medlineplus/ency/article/003610.htm

Medical Encyclopedia: Urinalysis

Alternative names
Urine appearance and color; Routine urine test

Definition
Urinalysis is the physical, chemical, and microscopic examination of urine. It involves a number of tests to detect and measure various compounds that pass through the urine.

How the test is performed
A urine sample is needed. Your health care provider will tell you what type of urine sample is needed. For information on how to collect a urine sample, see:

There are three basic steps to a complete urinalysis:

Physical color and appearance: What does the urine look like to the naked eye? For example, is it clear or cloudy? Pale or dark yellow or another color? The urine specific gravity test reveals concentrated or dilute the urine is.

Microscopic appearance: The urine sample is examined under a microscope. This is done to look at cells, urine crystals, mucous, and other substances, and to identify any bacteria or other microorganisms that might be present.

Chemical appearance: A special stick ("dipstick") tests for various substances in the urine. The stick contains little pads of chemicals that change color when they come in contact with the substances of interest.

How to prepare for the test
Certain medicines change the color of urine, but this is not a sign of disease. Your doctor may tell you to stop taking any medicines that can affect test results.

Medicines that can change your urine color include:

- Chloroquine
- Iron supplements
- Levodopa
- Nitrofurantoin
- Phenazopyridine
- Phenothiazines
- Phenytoin
- Riboflavin
- Triamterene

How the test will feel
The test involves only normal urination, and there is no discomfort.

Why the test is performed
A urinalysis may be done as a part of a routine medical exam to screen for early signs of disease.

This test may be done to check for blood in the urine or to diagnose a urinary tract infection. Your doctor may order this test if you have signs of diabetes or kidney disease, or to monitor you if you are receiving treatment for such conditions.

Normal Values
Normal urine may vary in color from almost colorless to dark yellow. Some foods (like beets and blackberries) may turn the urine a red color.

Usually, glucose, ketones, protein, bilirubin, are not detectable in urine. Hemoglobin, red blood cells, white blood cells, and nitrites, are not normally found in the urine.

What abnormal results mean

Bilirubin - urine: Bilirubin is a yellowish pigment found in bile, a fluid produced by the liver. Large amounts of bilirubin in the body can lead to jaundice.

Glucose - urine: The glucose urine test measures the amount of sugar (glucose) in a urine sample. The presence of glucose in the urine is called glucosuria

Protein - urine: A protein urine test measures the amount of proteins, such as albumin, found in a urine sample.

Red blood cells in urine test: The RBC urine test measures the number of red blood cells in a urine sample.

Urine ketones: A ketones urine test measures the presence or absence of ketones in the urine.

Urine pH: A urine pH test measures the acidity of urine.

Urine protein: A protein urine test measures the amount of proteins, such as albumin, found in a urine sample.

Urine specific gravity: Urine specific gravity is a laboratory test that measures the concentration of particles in the urine.

What the risks are:
There are no risks.

Special considerations
If a home test is used, the person reading the results must be able to distinguish between different colors, since the results are interpreted using a color chart.

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Updated by: Benjamin W. Van Voorhees, MD, MPH, Assistant Professor of Medicine,Pediatrics and Psychiatry, The University of Chicago, Chicago, IL. Review provided by VeriMed Healthcare Network.

Excerpted from http://www.nlm.nih.gov/medlineplus/ency/article/003579.htm

Using Urine Dipsticks to Detect Wegener's Granulomatosis

http://www.clevelandclinic.org/health/health-info/docs/3100/3158.asp?index=10971

Wegener's granulomatosis (WG) can affect the kidneys in 50%-80% of patients. The first sign of kidney involvement is the presence of blood and/or protein in the urine. In medicine, early detection of any problem is preferred. In the case of WG and the kidney, early aspects of injury are most likely to respond to treatment. Not detecting the first signs of kidney inflammation may lead to unrecognized and unnecessary kidney failure.

The blood test, serum creatinine, is a measure of kidney function. A rising value indicates that the kidney has already experienced significant injury. Before the serum creatinine rises, the first sign of injury is the presence of microscopic amounts of blood or protein in the urine. This is usually not seen by the naked eye. Detection of this early sign of kidney involvement is determined by a simple device called a "urine dipstick". Urine dipsticks are available in many drug stores over-the-counter.

If a patient has never had blood or protein in their urine, finding it for the first time would be an important sign of early kidney involvement. Hopefully such an early finding would be made before the serum creatinine started to increase.

It is not practical for a patient to see their doctor frequently to merely have a urinalysis performed by urine dipstick or for the doctor to frequently look at the urine under the microscope. It is practical

for patients who have never had blood or protein in their urine, to personally perform the urine dipstick test about once every one to two weeks.

A positive test for blood or protein should lead to an immediate phone call to the doctor. The doctor would then confirm the test as being positive or refute the results by finding that there may have been an error in reading or interpreting the results.

If an abnormal result is confirmed, the physician would then look at the urine under the microscope to see if there were other characteristics that would suggest kidney inflammation. Serum creatinine would be obtained to access whether some degree of kidney failure had already occurred.

For patients who have already have kidney disease, effective treatment may lead to improvement of kidney function, but blood and protein in the urine might persist for as long as a year and in some patients even longer. In this setting, the urine dipstick test by the individual patient is not very helpful.

For patients who have previously had kidney involvement and have subsequently done well, and the urine is now back to normal, the urine dipstick can be used as a tool to tell you whether kidney involvement has recurred.

Patients and doctors should know that there are many different causes of blood in the urine. Some examples include: urinary tract infection, kidney stones, or bleeding from a kidney cyst. None of these issues would be related to WG and each would require a different approach than that provided for WG. In brief, a dip stick test of the urine can be an extremely helpful diagnostic test, performed by the patient, to assist in ensuring the best possible care.

White Blood Count (WBC)

Definition: A WBC count is a blood test to measure the number of white blood cells (WBCs).

White blood cells help fight infections. They are also called leukocytes. There are five major types of white blood cells:

- Basophils
- Eosinophils
- Lymphocytes (T cells and B cells)
- Monocytes
- Neutrophils

Excerpted from http://www.nlm.nih.gov/medlineplus/ency/article/003643.htm

Red Blood Count (RBC)

Definition: An RBC count is a blood test that tells how many red blood cells (RBCs) you have.

RBCs contain hemoglobin, which carries oxygen. How much oxygen your body tissues get depends on how many RBCs you have and how well they work.

Excerpted from http://www.nlm.nih.gov/medlineplus/ency/article/003644.htm

Complete Blood Count (CBC)

Definition: A complete blood count (CBC) test measures the following:

- The number of red blood cells (RBCs)
- The number of white blood cells (WBCs)
- The total amount of hemoglobin in the blood
- The fraction of the blood composed of red blood cells (hematocrit)
- The mean corpuscular volume (MCV) -- the size of the red blood cells

CBC also includes information about the red blood cells that is calculated from the other measurements:

- MCH (mean corpuscular hemoglobin)
- MCHC (mean corpuscular hemoglobin concentration)

The platelet count is also usually included in the CBC.

Excerpted from http://www.nlm.nih.gov/medlineplus/ency/article/003642.htm

Plasmapheresis

Plasmapheresis is a process in which the fluid part of the blood, called plasma, is removed from blood cells by a device known as a cell separator. The separator works either by spinning the blood at high speed to separate the cells from the fluid or by passing the blood through a membrane with pores so small that only the fluid part of the blood can pass through. The cells are returned to the person undergoing treatment, while the plasma, which contains the antibodies, is discarded and replaced with other fluids. Medication to keep the blood from clotting (an anticoagulant) is given through a vein during the procedure.

What's involved in a plasmapheresis treatment?
A plasmapheresis treatment takes several hours and can be done on an outpatient basis. It can be uncomfortable but is normally not painful. The number of treatments needed varies greatly depending on the particular disease and the person's general condition. An average course of plasma exchanges is six to 10 treatments over two to 10 weeks. In some centers, treatments are performed once a week, while in others, more than one weekly treatment is done.
A person undergoing plasmapheresis can lie in bed or sit in a reclining chair. A small, thin tube (catheter) is placed in a large vein, usually the one in the crook of the arm, and another tube is placed in the opposite hand or foot (so that at least one arm can move freely during the procedure). Blood is taken to the separator from one tube, while the separated blood cells, combined with replacement fluids, are returned to the patient through the other tube.
The amount of blood outside the body at any one time is much less than the amount ordinarily donated in a blood bank.

Are there risks associated with plasmapheresis?
Yes, but most can be controlled. Any unusual symptoms should be immediately reported to the doctor or the person in charge of the procedure. Symptoms that may seem trivial sometimes herald the onset of a serious complication.

The most common problem is a drop in blood pressure, which can be experienced as faintness, dizziness, blurred vision, coldness, sweating or abdominal cramps. A drop in blood pressure is remedied by lowering the patient's head, raising the legs and giving intravenous fluid.
Bleeding can occasionally occur because of the medications used to keep the blood from clotting during the procedure. Some of these medications can cause other adverse reactions, which begin with tingling around the mouth or in the limbs, muscle cramps or a metallic taste in the mouth. If allowed to progress, these reactions can lead to an irregular heartbeat or seizures.
An allergic reaction to the solutions used to replace the plasma or to the sterilizing agents used for the tubing can be a true emergency. This type of reaction usually begins with itching, wheezing or a rash. The plasma exchange must be stopped and the person treated with intravenous medications.

Excessive suppression of the immune system can temporarily occur with plasmapheresis, since the procedure isn't selective about which antibodies it removes. In time, the body can replenish its supply of needed antibodies, but some physicians give these intravenously after each plasmapheresis treatment. Outpatients may have to take special precautions against infection. Medication dosages need careful observation and adjustment in people being treated with plasmapheresis because some drugs can be removed from the blood or changed by the procedure.
(Facts about Plasmapheresis Muscular Dystrophy Association Updated 07/05)

Get the Most from Your Health Care Team

From: www.FamilycareAmerica.com

Whether you are the primary caregiver for a family member, or even taking care of yourself, it pays to ask questions in a clear and assertive manner. Don't assume, "the doctor will let us know if …" The best patients work actively with the health care team.

Use these suggestions to take the initiative:
Stay educated on each condition or treatment
Discuss personal wishes
Prepare for doctor's appointments
Schedule regular discussions with all care team members
Call in "the cavalry" when necessary

1. **Stay educated on each condition or treatment**
Research suggests that caregivers and patients who educate themselves get better results from doctors.

- Learn all you can to explore treatment options and alternatives knowledgeably.
- Ask the doctor for books, video tapes or other materials that explain your loved one's condition and treatment.
- Get information from condition-specific organizations, such as the Alzheimer's Association and the American Heart Association.
- Speak up if you have questions or concerns. You have a right to question anyone involved with your loved one's care.

2. **Discuss personal wishes**
Before meeting with the doctor, get firm answers to the tough questions. Review these issues as early as possible, before there is a crisis. And consult a lawyer about living wills, durable powers of

attorney for health care, and other documents that can help ensure your loved one's wishes are carried out.

- Who should make medical decisions if your loved one cannot?
- What kind of medical intervention does your loved one want? Under what circumstances should heroic measures **not** be taken?
- What medications or procedures should be avoided?
- What worries or fears does our loved one have?

3. **Prepare for doctor's appointments**

Before each meeting with the doctor, make a list of issues you want to discuss. Write down questions in advance and make sure you have a pen and paper handy to take notes and record the doctor's answers. Consider asking the following types of questions:

- Can you explain the illness in non-medical terms? Where can I find more information?
- How has the situation changed since the last appointment?
- Are more tests required? A second opinion?
- What treatment options are available? Are there alternatives? What is likely to occur without any treatment?
- What are the side effects of these treatments? Of prescribed medications?
- How can you be reached? If you are unavailable, whom should we contact?
- What steps should we take in case of emergency? What is the likelihood of such an event?
- What are the next steps in the procedure or diagnosis?

4. **Schedule regular discussions with all team members**

A health care team may include a primary doctor, specialists, nurses, health aides, care professionals, family and friends. In cases of complicated illness, you may want to draw these people together for a "health care conference" that will get everyone on the same page. Don't assume all members of the health care team know the full picture; ask the primary care physician to take charge as "quarterback" to make sure everyone is clear about their roles.

5. **Call in "the cavalry" when necessary**

If you are unable to get the results you want on your own, find professional assistance:
If you are dealing with an eldercare situation, consider hiring a geriatric care manager.
Most health care facilities have resource persons such as social workers, patient advocates, chaplains, and nurses who will work for you and help clarify any concerns.
If you are battling the "system", enlist the help of your state ombudsman for managed or long-term care.

Tips for patients with Vasculitis

Adapted from article in Lupus Newsletter, Spring 1998

Each case of Vasculitis is different – Get to know your disease

Build an honest and open relationship with your doctor. It takes time to find the right medication and the dosage that works best to control your situation

Do not play with medications! Learn about them, the purpose for taking them and the side effects that you might encounter. Discuss this with your doctor and pharmacist.

Be honest with yourself and others. "Fine, thank you" is not always appropriate. "Off day" or "Sorry, I can't go out today" may be more applicable.

It is normal to grieve the loss of the "old" self. Learn to come to terms with your disease. Try to befriend it, not deny it.

Give yourself permission to be depressed for short periods of times. Develop a sense of humor and a positive attitude, and then get on with living!

Pamper yourself! This is your chance to sit back and let others do things for you. At first it is difficult to say, "Please, help me" but it gets easier with practice. Patience is an asset.

Keep a journal of symptoms, medication dosages and their side effects, plus your feelings. It will come in handy each time you visit your doctor.

Seek a support group. It is helpful to talk to others who have been through similar experiences to yours.

And remember…You are not alone!

Questions to ask your doctor

The following questions might be appropriate to ask one's physician when Autoimmune Vasculitis is suspected or diagnosed. The questions were prepared by a Wegener's patient (with no medical training) in July 2005.

Disclaimer:

1. These questions are NOT intended to be presented directly to a physician. The sheer number of questions would likely result in a negative response.

2. They are intended to be used to help the patient or advocate write up 5-10 questions for each upcoming appointment as seems applicable.

3. The background comment (BG) with each question is to help the patient know why the question is appropriate at times.

4. PLEASE NOTE: Patients should NOT submit these questions as written to their physician. The list was created to help patients develop their own questions.

5. Each AV patient must educate themselves about the disease and treatment options for their own protection and effective treatment. Please be sure to state to the physician that you understand he/she may not have the answer right at hand.

The first and most important question to be asked is:
1. "Have you treated many vasculitis patients and what were the outcomes?"
BG - As AVs are rare, it is vital to effective treatment to be examined by persons with adequate experience and training in diagnosing and treating autoimmune vasculitides (AVs).

Initial and Diagnostic Questions
2. Should I be referred to another physician or specialist with considerable experience diagnosing and treating my symptoms?
BG - Most physicians, including most specialists, will not have seen a case of AV in the course of their practice. This means the patient must seek the expertise needed with his/her physician's help. The specialists most likely to have experience with the AV diseases are rheumatologists; so requesting a referral to a rheumatologist is a prudent first step.

3. What types of specialists should I see as part of the diagnostic procedure?
BG - Depending on the specific organs attacked by the AV, various specialists may be involved in the patient's diagnosis and treatment.

4. Once diagnosed, should I get a second opinion from a major medical center or specialist?
BG - It is generally considered good medical practice for most serious medical conditions including AV to get a second opinion by a physician experienced and specializing in the diagnosis and treatment of the disease.

5. Is my condition likely to be caused by an autoimmune vasculitis?
BG - There are vasculitides that are not autoimmune vasculitis. These can be caused by allergies, infections, medications or environmental conditions. It is important to know if the condition is autoimmune or some non-autoimmune vasculitis.

6. If a vasculitis is not autoimmune, what kind do I have?
BG - Hypersensitivity vasculitis or vasculitis as the result of infection are treated differently than an autoimmune vasculitis. It's important to know what kind of non-autoimmune vasculitis one has.

7. If an autoimmune vasculitis, which kind do I have?
BG - There are a variety of related autoimmune vasculitides with varying and sometimes overlapping symptoms, which may be organ specific in their manifestations. It is important to know which specific organs are involved, but may not always be the determining factor in selecting the treatment regimen.

8. What is the severity of my current condition? (Mild, Serious, Grave)
BG - The severity of the patient's condition at diagnosis and the precise organs involved will determine whether a rescue therapy is necessary, and if not, which treatment options are appropriate.

9. What is the usual prognosis for my current condition?
BG - It can ease the patient's concerns if they have some idea of the likely outcome of treatment.

10. What kind of diagnostic tests have you ordered or will be ordered?
BG - It is helpful to the patient to know how many tests of what type and why they are ordered and what times and special preparations will be required of the patient.

11. What baseline tests should be run?
BG - As an AV patient you will be followed carefully, it is important to have a series of baseline tests to establish your initial condition so that later tests will have a basis on which to judge if a particular condition is improving or worsening.

12. Should there be a baseline bone scan?
BG - As most AV patients are on a corticosteroid such as prednisone for long period(s), a baseline bone scan can be important for early detection of osteopenia or osteoporosis.

13. Will I need a biopsy? Of what organ(s) and what is the procedure to be used?
BG - Tissue samples (biopsies) are often used to help define the specific status of the AV in the patient. Some physicians will not treat for AV without a biopsy positive for AV. Physicians with considerable experience treating AV will use their judgment on whether or not to treat as an AV without a positive biopsy. The patient should know what biopsies are ordered, why, and what is involved so that they can be better prepared to understand the need for these procedures and the methods to be used.

14. Could a guided needle biopsy be useful and safer than an open lung biopsy?
BG - The "guided needle biopsy" is minimally invasive and may be satisfactory if a lung, kidney, or other biopsy is required. Surgery to open the chest or abdomen for biopsy of organs is a highly invasive procedure and probably should be avoided if possible. If open cavity surgery is required, the patient needs to understand why and what the risks are.
15. Will my biopsy be sent to at least two pathologists who are not associated in the same practice?
BG - Pathologists have mistaken granulomas for lung cancer and other conditions so that biopsies might well be submitted to two or more independent pathologists for their interpretation of the samples.

16. What kinds of radiograph tests are needed (x-ray, CT scan, MRI, ultrasound, other)?
BG - Some types of AV result in lung or other organ damage, not always detectable by x-ray. It may be prudent to have CT scans, MRIs, or ultra-sound tests to fully determine the extent of the patient's disease. For Central Nervous System (CNS) involvement, a digital subtraction MRA might be appropriate.

17. Will my radiographs be sent to at least two radiologists not associated in the same group practice?
BG - Radiologists have mistaken AV lung damage as lung cancer. It may be prudent to have radiographs submitted to two or more independent radiologists for interpretation.

18. Do I need lung function tests?
BG - Some AVs frequently involve lung damage so baseline lung function tests should be done in cases where lung involvement is known or suspected. Periodic checks should be made at the physician's judgment.

19. Do I need any endoscopic examinations and what is involved?
BG - Endoscopic examination of the pulmonary, upper airway, and G/I tracts may be required to determine the extent of the disease particularly in the cases of Polyarteritis Nodosa, Churg Strauss syndrome and Wegener's granulomatosis. Patients need to understand the procedures in order to not have undue anxiety.

20. Should I be tested for Alpha-1 antitrypsin deficiency?
BG - Alpha-1 antitrypsin deficiency (AATD) has been found in a percentage of AV patients. If an AV is suspected or diagnosed, a test for the level of alpha-1 antitrypsin deficiency may be prudent. AATD causes progressive lung and possibly liver damage if untreated.

21. What further tests are required before I can begin treatment?
BG - Depending on the patient's symptoms, history, and clinical examination results, other tests may be indicated such as hearing, vision, endocrinology functions, adrenal and thyroid functions, etc.

Disease Questions
22. Why did I develop an autoimmune vasculitis?
BG - The exact causes of autoimmune vasculitides are unknown.

23. What are the frequent symptoms of my type of vasculitis?
BG - Each AV has its distinguishing characteristics. The symptoms may vary from patient to patient yet there are patterns of usual organ involvement for each type of AV. The patient should know there is a possibility they may develop some of the more common symptoms than they already have.

24. What are the infrequent symptoms of my vasculitis?
BG - The patient should know the less likely symptoms besides the ones they already exhibit in order that they not be unduly concerned about new symptoms, but promptly report those to their physician
25. Is my vasculitis contagious?
BG - AV patients need to know if their conditions are a danger to others.

26. Is my vasculitis inheritable by my children?
BG - None of the AVs are directly inheritable but it is reassuring to have that clarified by one's physician.

27. Could my disease be caused by medications I'm taking or by environmental exposures?
BG - Some vasculitides are caused by medications, infections, or exposure to unusual elements in the environment, but these are not autoimmune vasculitides. It is important that one not be treated for an AV if the causes of the vasculitis are other than immune system dysfunction.

28. Could I have avoided getting this disease?
BG - Generally speaking, as causes are virtually unknown, the only possible ways known to help avoid AV are avoiding exposure to particulate silica and excessive physical or emotional stress.

29. How frequent is my vasculitis in the general population?
BG - It is well to understand how rare the disease is to appreciate the lack of knowledge and experience with AVs in the medical community.

30. Does having relatives with autoimmune diseases have something to do with my having vasculitis?
BG - Autoimmune diseases tend to run in families so there is apparently a genetic predisposition to autoimmune disease. It may be helpful to close relatives to know one in the family has AV.

31. What are similar kinds of autoimmune vasculitis besides the kind I have?
BG - As symptoms overlap between various AVs, it may be helpful for the patient to know that.

32. Am I more likely than average to have another autoimmune disease?
BG - Persons with one autoimmune disease are at a somewhat greater risk for developing a second autoimmune disease than is the general population. It is good for the patient to understand that in order to identify any newly developed autoimmune disease as early as possible.

33. What are my chances of relapse once the disease is inactive?
BG - The AV patient should know if relapse is likely or unlikely so that so the patient has reasonable expectations and so that new or renewed symptoms can be dealt with promptly.

Treatment Questions
34. How long before I can start treatment?
BG - With possibly serious consequences to delay of treatment, the patient needs to be assured when treatment will begin, and what the treatment will likely be.

35. Who will coordinate between my primary care physician and any specialists involved?
BG - With multiple physicians involved in the patient's care, it is important that each physician be promptly notified of all actions, medications, procedures, and changes in the patient's condition.

36. Should I be hospitalized?
BG - Some AV cases can abruptly endanger organs and the patient's life. In some cases hospitalization is needed to allow procedures and care that can only occur there. It is well that the patient knows that as soon as possible in order prepare mentally and arrange affairs to ease the strain of hospitalization.

37. I currently have an infection of the _____. Does that effect my treatment?
BG - Any infection may restrict the options for treatment of the AV. It is important that the patient's physician know of any infection before and during treatment.

38. How aggressively does my condition need to be treated to stop further damage?
BG - The degree of aggression used to treat the AV is determined by the treating physician. It seems likely that more AV patients suffer from treatment that is inadequate than are harmed by overly aggressive treatment.

39. Do I need to have a test for tuberculosis before starting on an immunosuppressive or steroid?
BG - Immunosuppressives used to treat AVs can permit latent infections to become active. If a patient has been in locations where they might likely have been infected by TB, or has had a positive result from a previous TB test, then that patient must be treated to prevent TB from becoming active.

40. Should I have plasmapheresis treatments? How many?
BG - In highly active AV cases, a rapid improvement may be achieved by removing the harmful antibodies from their blood stream. The treatment can be repeated as necessary.

41. Would intravenous gamma globulin be appropriate treatment?
BG - Gamma globulin has proven effective in treating some AVs but it is not risk free.

42. What short- and long-term side effects can I expect from use of prednisone (or similar steroid)?
BG - Prednisone can have serious short and long-term side effects. The AV patient should learn what these are in order to not be surprised when a side effect appears, and also to be better able to differentiate between a steroid side effect and a symptom of the AV.

43. If I'm on a steroid, should I have calcium supplement, extra vitamin-D, and either a biphosphonate (such as Fosamax or similar) or PTH to prevent osteopenia or osteoporosis?
BG - Even short-term corticosteroids can cause loss of bone mass. That effect can be reversed by use of calcium supplements, extra vitamin D, perhaps supplemental magnesium, and an appropriate medication that stimulates bone growth.

44. Does my condition warrant use of Cytoxan, Cellcept, Imuran or similar broad immuno-suppressive?
BG - While some mild AVs may be treated by steroidal medications alone, many cases require the use of one or more immunosuppressive drugs to stop the overly active immune system from producing too much harmful antibody. The use of powerful broad immunosuppressive agents such as Cytoxan (cyclophosphamide) can have serious side effects, so their use must be carefully weighed.

45. If I will be on an immunosuppressives, at what dosages and for how long?
BG - Immunosuppressives have side effects that usually require some adjustment in your activities. The patient's concerns can be relieved if the patient knows what immunosuppressant will be used and how.

46. If I will be on an immunosuppressive, will it be oral or intravenous?
BG - While there is some controversy, it appears that a daily orally administered immunosuppressive may be more effective than a periodic intravenous injection. The higher risks associated with a daily dosage versus the periodic injection have to be considered when deciding on the treatment regimen.

47. If I'm on an immunosuppressive, what short and long-term side effects are likely?
BG - Powerful broad immunosuppressive agents such as cyclophosphamide can have serious side effects. It will be useful for the patient to know what might be experienced so not to be overly anxious when side effects appear. The patient's physician may suggest ways to ameliorate some side effects.

48. Could one of the biologicals such as Enbrel, Remicade, Humira, or Rituxan be more appropriate instead an immunosuppressive?
BG - There are now a number of "biological" medications that are monoclonal antibodies. These are expensive drugs usually given by injection at weekly or bi-weekly intervals. They are narrow or targeted immunosuppressives that don't attack many types of cells, but rather disable certain harmful cytokines (chemical signals between cells). They can be highly effective with fewer side effects than the non-biological immunosuppressants.

49. Will I be susceptible to opportunistic infections? If so, what prophylactic measures to avoid infection will be appropriate?
BG - Immunosuppression by any means makes a person more susceptible to opportunistic infections.

Disease Tracking Questions
50. How often will I need appointments to see you? How often can I expect blood and urine tests?
BG - Patients may need to arrange for childcare, time off work, or to have an advocate accompany them.

51. How often will I have to have radiographic tests? (X-ray, MRI, CT scan, ultrasound)
BG - Patients may need to adjust their schedules and the schedules of others to allow the necessary tests.

52. Are there other specialists I should routinely be seen by, and how often?
BG - Depending on the organs involved and the severity of the involvement, the patient may need to have scheduled periodic appointments with various specialists.

53. What blood test results should I use as a possible indication of disease activity?
BG - From lab test reports, a patient may sometimes choose to track their own progress toward remission (within the limits of applicability).

54. What urine test results should I use as an indication of kidney dysfunction?
BG - If kidneys are involved in AV, then the patient may well want the assurance of knowing if their kidney function improves or deteriorates.

55. How will I get copies of my lab test results, radiograph reports, and clinical exam reports?
BG - Patients often find it useful to track certain test results to know if progress toward remission is evident.

56. How can I be assured that significant changes in lab or radiograph test results will be not be delayed in reaching you?
BG - It is important the patient has some assurance that the physician will be promptly notified of significant changes in test results, if such results are received by an office employee or transferred by a process involving delay such as U.S. mail.

57. Should I use urine dipsticks at home to test for protein and blood?
BG - Dipsticks are available to test urine at home. Patients need to know if they should use dipsticks and what type to use.

Life Change Questions
58. Will the medications on which I will be effect my fertility?
BG - Some medications used to treat AVs may diminish female or male fertility. Some patients may become infertile as a result. Treatment decisions may be effected by the question of possible sterility.

59. I plan on having children. Are there alternative medications that can effectively treat my autoimmune vasculitis without causing sterility?
BG - Some "biological" medications may be suitable to treat WG without threatening fertility.

60. I'm pregnant. Will my vasculitis endanger the embryo or fetus?
BG - Certainly a major issue where the patient needs to know the possibilities.

61. I'm in my first trimester, what medications, non-prescription medications, and dietary supplements must I avoid?
BG - Some medications, non-prescription medications, and dietary supplements may interact with medications used to treat the AV, or may reduce or enhance the effectiveness of medications used to treat AV.

62. I'm past my first trimester, what medications, non-prescription medications, and dietary supplements must I avoid?
BG - Some of the restrictions on medications, non-prescription medications, and dietary supplements may be lifted after the first trimester.

63. What precautions do I need to take to avoid aggravating my condition?
BG - There may be behaviors, medications, or supplements that are likely to aggravate the AV and are best avoided.

64. Are there things I can do to avoid recurrence of active AV?
BG - The patients need to know what means is within their power to help avoid relapse.
65. What changes in my usual diet do I need to make?
BG - There may be foods to be avoided or a different balance of protein, fats, and carbohydrates that might impact AV activity.

66. Are there vaccinations I should have or shouldn't have?
BG - Certain vaccinations may not be safe. Others may be prudent. Still others may be mandatory.

67. Will I need vitamin or mineral supplements?
BG - Depending on age, disease activity, sex and other factors, physicians may wish to instruct the patients to take vitamin and mineral supplements.

More Life Change Questions
68. Can I drink alcohol during treatment?
BG - Some treatments challenge the liver so that minimal use of alcohol may be indicated or even abstinence.

69. Will I have to change my activities while I'm in treatment?
BG - Because of the disease and medications, it's possible that an AV patient may have to reduce certain activities in order not to aggravate their condition.

70. What over-the-counter medications and dietary supplements must I avoid?
BG - Interactions between medications and dietary supplements may interfere with the treatment of AV.
71. How much exercise should I undertake while in treatment?
BG - Exercise within reasonable limits may be helpful, but never near exhaustion.

72. How is the vasculitis and treatment likely to affect my friends and family?
BG - AV patients should be aware that both the disease and the medications might cause them to behave uncharacteristically. Because AV patients often look well, many will be thought to be less ill than they are in actuality.

73. What should I tell people who ask about my disease or condition in order to not be shunned or left out?
BG - Use of the word immune or autoimmune may trigger the assumption that one has HIV (AIDS). Comparing AV to lupus may help some understand. Simple "inflammation of blood vessels that damages organs" might be enough.

Emergency Questions
74. What particular symptoms should I regard as an emergency?
BG - Certain symptoms are ones requiring rapid medical attention.

75. Under what circumstances should I go the Emergency room at my local hospital
BG - Excessive unnecessary use of emergency facilities is to be avoided, but when in doubt, do go.

76. Under what circumstances do you want me to contact you outside office hours?
BG - Some physicians choose to be notified outside of office hours for specific occurrences.